Expressive Movement and the Perceptual-motor Development of Young Children from Disadvantaged Communities

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Declaration

I, the undersigned, hereby declare that the work contained in this dissertation is my own original work and that I have not previously, in its entirety or in part, submitted it to any university for a degree.

November 1998

Date

Abstract

The purpose of this study was to investigate the influence of participation in an expressive movement programme on the gross motor co-ordination, visual-motor integration and the self-concept of 117 pre-school children from a disadvantaged community. In order to maximise the accuracy of the results, a time series design was followed. Participants were divided into two experimental groups. All participants were pre-tested, then one group received the 7 week expressive movement programme while the second group received no treatment. All participants were then post-tested, followed by another 7 week intervention programme given to the second group, while the first group received no further intervention. All participants were then post-tested again. Data collection for all three dependent variables was completed using the Charlop-Atwell Scale of Gross Motor Co-ordination, the Beery Developmental Test of Visual-motor Integration, and the Primary and Pre-School Self-Concept scale.

Results of this study revealed that the pre-school children realised the following outcomes of participation in an expressive movement programme:

- Significant enhancement of gross motor co-ordination
- Improvement in visual-motor integration as reflected in the drawing ability of the children
- Significant enhancement of self-concept

Based on these results, it was concluded that participation in expressive movement programmes can make a significant contribution to the development of pre-school children, and therefore should be integrated as a formal content area within their curriculum.

Opsomming

Die doel van hierdie studie was om die invloed van deelname aan 'n ekspressiewe bewegingsprogram op die grootmotoriese koördinasie, visueel-motoriese integrasie en selfkonsep van 117 pre-primêre kinders vanuit 'n minderbevoorregte gemeenskap te ondersoek ten einde die akkuraatheid van die resultate te optimaliseer, is 'n opeenvolgende tydsgebonde eksperimentele ontwerp (a time series design) gevolg. Die deelnemers is in twee eksperimentele groepe verdeel. Alle deelnemers het 'n pre-toets ontvang waarna die een groep aan 'n 7 weeklange ekspressiewe bewegingsprogram deelgeneem het, terwyl die ander groep geen intervensie ontvang het nie. Alle deelnemers het toe 'n post-toets ondergaan, waarna die tweede groep onderwerp is aan 'n 7 weeklange intervensieprogram, terwyl die eerste groep aan geen verdere behandeling blootgestel is nie. Hierna is alle deelnemers weer aan 'n post-toets onderwerp. Dataversameling vir al drie afhanklike veranderlikes is voltooi deur die gebruik van die Charlop-Atwell Skaal vir Grootmotoriese Koördinasie, die Beery Ontwikkelingstoets vir Visueel-Motoriese Integrasie en die Primêre- en Pre-primêre Selfkonsepskaal.

Resultate van hierdie studie het aangetoon dat die voorskoolse kinders die volgende uitkomste met betrekking tot deelname aan die ekspressiewe bewegingsprogram, behaal het:

- Betekenisvolle verbetering van grootmotoriese koördinasie
- Verbetering van visueel-motoriese integrasie soos gereflekteer deur die tekenvermoëns van die kinders.
- Betekenisvolle verbetering van selfkonsep.

Gebaseer op hierdie resultate, is daar tot die gevolgtrekking gekom dat deelname aan 'n ekspressiewe bewegingsprogram 'n betekenisvolle bydrae kan lewer tot die ontwikkeling van voorskoolse kinders en as sulks geïntegreer moet word as 'n formele leerarea in hul kurrikulum.

To my parents

Table of Contents

List of Figures

List of Tables

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Chapter 1

Problem Identification

> Many children are coming into our schools lacking in basic perceptual-motor skills. As a result of this basic lack, they are less able to participate in the formal educational activities which are arranged for them and they are less able to learn from these activities. They become slow learners in the classroom (Kephart, 1960, p. 17).

Gross motor co-ordination is an essential component of the development of perceptual-motor skills (Charlop & Atwell, 1980; Gallahue & Ozmun, 1995; Pienaar, 1992). It includes the development of body awareness, the spatial and temporal awareness reference system that is so crucial to the acquisition of motor skills by young children (Cratty, 1970; Gabbard, 1988; Grineski, 1988; Van Niekerk, 1986). For example, underdeveloped body awareness and spatial- and temporal orientation are manifested in difficulties with sensory-motor co-ordination and may be accompanied by the left-right discrimination problems associated with dyslexia (Feldenkrais, 1984; Lerch, Becker, Ward & Nelson, 1980; Pretorius, 1995). Efficient perceptual-motor development is a prerequisite to school readiness ensuring the maximising of optimal learning potential inherent in every child (Grové, 1986).

Developmentally appropriate movement programmes can stimulate young children to acquire an interest in learning, to be willing to try new things, to trust adults, to establish a sense of independence and to learn positive social behaviours (Schweinhart & Weikart, 1986). Scientific findings from South African resources have demonstrated that early childhood development programmes not only can lead to immediate benefits for the child, but also can produce long-standing benefits in terms of the child's ability to contribute to the community (National Educational Co-ordinating Committee - NEPI, 1992). One dimension of these early childhood programmes that has not been investigated, however, is the potential contribution that an expressive movement programme (one that emphasises creative movement responses and the styles of teaching associated with movement exploration) can make to the development of the perceptual-motor development of young children.

A pressing need exists in general for developmental research in South Africa from a multi-cultured perspective, as past educational policies have lead to large gaps in scientific, social and cultural knowledge (Liddell & Kvalsvig, 1990; Schoeman, 1993). Information compiled by the South African Institute for Race Relations (SAIRR) in 1992 revealed that 47% of the total population was under the age of 19 years (SAIRR, 1992). Despite this demographic pattern, publications on developmental issues over the five years prior to 1991 constituted only about 10% of all educational research published in South Africa (Mayer, Marais & Prinsloo, 1991). Herbert and Katzenellenbogen (1995) identified specifically the need for research pertaining to the movement performance of young children from disadvantaged backgrounds in South Africa, including research into early childhood programmes.

Statement of the Problem

This investigation focused on the impact of participation in an expressive movement programme on selected aspects of children's perceptual-motor development and self-concept. Because of the urgent need for information about children from disadvantaged communities, the subjects invited to participate in this study were so-called "Coloured" children (see definitions section at the end of this chapter) living in the western suburban area of Port Elizabeth.

The primary aim of this study was to investigate the effect of participation in an expressive movement programme on the development of gross motor co-ordination and visual-motor integration as aspects of perceptual-motor functioning of young children from a specific urban geo-physically deprived milieu. In this case of this study, that milieu was one of low socio-economic status and poverty.

The secondary aim of this study was to investigate the effect of participation in an expressive movement programme on the development of the self-concept of the children from this deprived milieu.

Hypotheses

The following hypotheses guided this investigation:

1. Participation in an expressive movement programme will facilitate the development of the gross motor co-ordination of young children.

2. Participation in an expressive movement programme will facilitate the development of the visual-motor integration of young children.

3. Participation in an expressive movement programme will facilitate the development of the self-concept of young children.

Significance of the Study

Knowledge about children in South African cultures has been evaluated as sketchy and incomplete (Allan, 1992; Dawes & Donald, 1994). Taking cognisance of the impact of socio-cultural heritage and the geo-physically deprived milieu on child development, it is deemed essential to build systematically the scientific knowledge required for making informed decisions about the education of children in South Africa. In relation to young children and movement programmes, Herbert and Katzenellenbogen (1995) specifically called for further investigations into the potential for programmes emphasising movement creativity and movement exploration on the development of young children.

Many teachers may believe that they have inadequate knowledge of and preparation for actively stimulating perceptual-motor development of young children. A dire need exists for movement content packaged into educational programmes. When contrasted to using games as content, the utilisation of expressive movement as a medium to enhance the development of perceptual motor abilities and self-concept has often met with ignorance, discomfort and trepidation on the part of teachers (Gabbard, 1988; Gallahue & Ozmun, 1995; Grineski, 1988; Herkowitz, 1977). The design of an expressive movement programme that stimulates fundamental motor skills, body awareness, spatial awareness, temporal awareness and balance through expressive movement, must therefore be considered an important contribution of this research.

Perhaps the most significant aspect of this study is its holistic approach to early childhood education, combining a perceptual-motor development programme with the development of self-concept of young children. Developmental assessment of young children is crucial in the early detection of developmental lag in perceptual-motor abilities, specifically if they were exposed to a geo-physically deprived milieu. Early identification of children with potential developmental problems should be coupled with early supplementary, enriching or remedial programmes that could help to reduce the risk of scholastic failure and associated affective and behavioural adjustment problems. As a result of this investigation, the importance of including expressive movement experiences as an integral part of the early childhood education curriculum will be more clearly understood. The relationship between participation in such a programme and the development of self-concept will also be better defined.

Methodology

Because this research involved intervention with an expressive movement programme in a field-based setting, a quasi-experimental approach was followed. A non-equivalent group design was employed that allowed for the assessment of a treatment group and a comparison group on pre- and post-test measurements of selected perceptual-motor variables, visual-motor variables, and self concept.

- The *Charlop-Atwell Scale of Gross Motor Co-ordination* was utilised to measure gross motor co-ordination, a dependent variable, reflecting a major component of perceptual-motor development and indicating competence in the execution of fundamental movement skills.

- The *Beery Developmental Testof Visual-motor Integration* was selected as an age appropriate assessment tool to measure the second dependent variable, visual-motor integration.

- Operating under the assumption that the child is the most appropriate person to provide information about his or her self-concept, the semantic differential *Primary and Pre-school Self-concept Scale*, consisting of pictorial stimuli and

sets of bipolar adjectives such as happy-sad and fast-slow, were used in the assessment of self-concept.

The subject sample consisted of one hundred and seventeen (N=117) children living in the western suburban area of Port Elizabeth in the Eastern Cape province, whose ages ranged from 4.8 to 6.9 years old. The Eastern Cape is the second largest of South Africa's nine provinces, and covers 14% of the country's total area. The province has the second largest school enrolment, with 2 294 505 learners at all levels in 1997, comprising about 18% of South Africa's total learner population (HSRC, 1996).

The rationale for selecting this age group was that early childhood has been identified as a critical developmental period in the life of a child. It is during this period that he/she must learn to master specific developmental tasks which are regarded as the "building blocks" for optimal future development (Bee, 1989; Gallahue & Ozmun, 1995; Louw, 1990; Vrey, 1984; Wicks-Nelson & Israel, 1984). These children from a geo-physically deprived milieu were selected because it was suspected that the poverty and previous patterns of discrimination that have affected their community could have had a negative impact on their rate of development in terms of perceptual-motor abilities and positive self-concept.

Limitations

The following limitations in the design and implementation of this research may have had an impact on one or more aspects of the investigation, and therefore must be kept in mind when considering the results.

- Due to violent political unrest in the western suburban area of Port Elizabeth at the time of the study, a non-random sample and a convenience sampling method had to be used. This could have influenced the external validity of the research.

- The respondents in the sample were from one geographical location only, which could limit the generalisability of results to the wider population.

- Due to a high drop-out rate and illness at the various times of assessment, valuable raw data was not available on all subjects who initially took part in the project.

- There are many instruments available that measure perceptual-motor development, visual-motor abilities and self-concept. Although the selection of the measurement instruments was made carefully, other results may have been produced if other instruments had been used to collect data. This study must therefore accept all of the limitations attached to those measurement instruments selected.

- Although the term "geo-physically deprived milieu" is applicable to all racial and cultural groups who may be described as "deprived" or "disadvantaged," the subjects in this study were all from a "so-called Coloured" predominantly Afrikaans-speaking community. Although now regarded as Black South Africans, it is possible that that there are some racial and cultural factors associated with their heritage that would influence the generalisability of the results of this study to other children from disadvantaged groups.

Terminology

The following terms were defined in the following ways for use in the context of this research.

Expressive Movement

Expressive movement refers to movement experiences emphasising concepts dealing with body awareness, spatial awareness, temporal awareness, dynamics and relationship, performed in a creative and imaginative manner, usually employing the exploration and discovery styles of teaching.

Disadvantaged

Disadvantaged is used as an adjective to qualify reference to persons from or characteristics of a geo-physically deprived milieu. This is not a racial or culturally bound

concept and its specific characteristics will vary from country to country. Children from "disadvantaged" backgrounds are not sufficiently prepared for successful participation in school or in their society. The child may have been isolated from experiences, brought about by poverty, meagreness of intellectual stimulation, illiteracy, etc. For purposes of being both succinct and clear in this investigation, a geo-physically deprived milieu will be referred to as a "disadvantaged community."

Gross Motor Co-ordination

Gross motor co-ordination is the effective and efficient use of the total body in large/gross motor activities that require temporal and spatial co-ordination of sequences of movements or simultaneous execution of the movement of body parts, typically including skills such as walking, running, hopping, skipping, jumping, balancing, throwing and catching, dynamic and static balancing.

Self-concept

Self-concept is a general concept including how children feel about themselves and how they perceive others to think about them. It includes their feelings of belonging, self-worth, competence and acceptance of self and is formulated with reference to social interaction with significant others, such as parents, teachers, and peers.

Visual Motor Integration

Visual motor integration is the performance of fine perceptual-motor tasks that involve the co-ordination specific visual input with a specific motor response drawing, e.g. viewing a geometric figure and then drawing a copy of it. The fine motor skills involved predominantly use the hand and fingers to produce precision movements, and specifically rely on eye-hand co-ordination for successful task accomplishment.

Young Children

Young children refers to individuals with chronological ages between 3 and 7 years old, who are projected to be in the fundamental phase of their motor development.

Summary

The repertoire of movement vocabulary with which the young child enters school will have an important effect on his/her ability to participate fully in the formal educational experience. The establishment of the new Policy of Education in 1994 in South Africa and the resultant changes in the cultural and racial composition of children in schools, requires that an expanded knowledge base be established to guide educational decision-making. That knowledge base must include information about children from disadvantaged communities. It was the purpose of this investigation to:

- Design an expressive movement programme which could be implemented in early childhood education, stimulating fundamental motor skills, body awareness, spatial awareness, temporal awareness and balance in an explorative way

- Determine the effects of such a programme on the gross motor co-ordination, visual motor co-ordination, and the self-concepts of young children from a disadvantaged community.

Chapter 2

Theoretical Background and Review of Literature

A good standard of performance in gross and fine motor skills is considered a prerequisite to young children's steady progress and full participation in their lessons at school (Wright, 1997). Delays or deficiencies in the development in motor skills at an early stage of a child's education can hinder the learning process (Geuze & Börger, 1993; Henderson, 1992; Losse et al. 1991). Children who experience movement development difficulties also may encounter additional negative effects related to social and affective variables, e.g. self-concept, locus of control and the ability to use goal setting (Henderson, 1992; Henderson et al. 1989). Movement problems have also been associated with behavioural difficulties that may stem from the frustrations children can experience when they have not developed the necessary functional skills to successfully participate in classroom activities (Schoemaker & Kalverboer, 1994).

Any efforts to provide quality early childhood education should include the search for effective movement education programmes designed to facilitate children's motor development (Wright, 1997). The earlier in a child's life that a programme of intervention can be organised for a child with movement difficulties, for example, the greater the positive effect of that treatment (Cantell et al. 1994; Losse et al. 1991). The importance of movement education during the early childhood period is based on the premise that generalisation of treatment effects to a variety of movement contexts is more likely to occur with young children because the differentiation process in their learning has only just begun (Schoemaker et al. 1994). Differentiation is a developmental process in which motor skills gradually become more task specific. Hoare (1994) recommended that programmes be designed and tested in which children with identifiable perceptual motor deficits be given intervention activities that focus on experiences focused on that deficit.

It has been estimated that there is a high risk of developmental problems among many young South African children, due to their low socio-economic and health status. Poverty, familial strain, overcrowding, violence, educational deficiencies, and pervasive

climate of change in South Africa have all contributed to an increased risk of developmental problems (Dawes & Donald, 1994). De Jong (1986) suggested that school failure in the first few years is an increasing problem in South Africa, especially among Black children. He stated that one of the reasons for school failure was that the children were not "school ready", and thus were "at risk" for developing educational problems from the beginning of their school experience.

If early childhood or "pre-school" programmes are to be developed to assist in the preparation of South African children from disadvantaged communities for school, then the movement education aspects of such programmes must also be defined. Research addressing children and their perceptual-motor function can contribute to the knowledge base needed for programme development. In order to help establish this knowledge base, the following review of literature is focused on the development of gross motor coordination and visual-motor integration as essential components of perceptual-motor development. Perceptual-motor function is regarded as basic to the skills children need to deal effectively with the physical realities of their environment. Research relating to children's self-concept development is also addressed, because movement skill acquisition is regarded as an important medium through which a positive self-concept may be formed if children experience themselves as efficient and effective performers in their environment (Gallahue, 1989).

Gross Motor Development

The early years of motor development set the foundation of neuromuscular coordination that will be used by the individual throughout life to deal with a variety of social, affective, cognitive and recreational dimensions of living. The years from two to six are considered the "golden years" for motor development (Flinchum, 1988; Gesell , 1973; Williams & De Oreo, 1980). During this period, most children acquire their basic repertoire of manipulative and locomotor skills, develop goal-directed motor behaviours and learn to put together two or three movement sequences to help them accomplish specific end goals (Bruininks, 1978; Cratty, 1970; Paget & Bracken, 1983; Piaget, 1963). All of these

behavioural achievements are forerunners of important aspects of adult functioning and are contingent upon the child's acquiring an adequate base of motor development.

In the literature, motor development refers to progressive changes in motor behaviour throughout the life cycle. As a process, motor development involves the underlying biological, environmental and task demands influencing both the motor performance and movement abilities of individuals from infancy to old age (Gallahue & Ozmun, 1995). The term "gross motor development" refers to the complexity of changes that take place in the child's life in terms of participation in physical activities and motor skill performance associated with the larger muscle groups of the body (Bee, 1989). During the pre-school years, motor development involves differentiation of the large muscle groups of the body which are essential for the performance of fundamental movement patterns (Drowatzky, 1981). These fundamental patterns have been defined the basic locomotor, manipulative and stabilising movements that involve the combination of movement patterns of two or more body segments (Gallahue & Ozmun, 1995). Fine motor development refers to the development of movement patterns involving limited movements of body parts in the performance of precise movements. The focus of the current investigation is on gross motor development.

Motor development emerged as a formal area of investigation in the 1930s. Up until the 1970s, research efforts were basically of two types (cross-sectional or longitudinal) and were broadly focused on one of the following objectives (Thomas, 1984):

1. The identification of milestones at which certain movement patterns should emerge or change, e.g. running, throwing, hopping, etc.

2. The age levels associated with typical motor performances, e.g. how much faster do eight-year-olds run than six-year-olds.

These studies produced detailed descriptions what the typical performances were for children at various ages. As a result of these lines of inquiry, motor development is often conceived in the literature as a smooth predictable progression from the unskilled to the skilled level, with specific skills emerging in an orderly sequence (Bairstow & Laszlo, 1981). From this perspective, motor development may be viewed as a sequence of phases within stages that can be traced throughout the lifespan (Gallahue & Ozmun, 1995).

Components of Motor Development

In addition to the fundamental movement patterns associated with locomotion, postural control and manipulation, there are a number of perceptual-motor abilities or functions that are identified as critical components of motor development. The following sections describe the most relevant of these components in terms of the motor development of young children.

Body Awareness

Body awareness is also referred to as body concept or body knowledge. It is associated with the internal awareness of the location of one's body parts and their relationship to each other. Furthermore an understanding of one's movement capabilities is required. Kachelhoffer (1988, p. 11) made a schematic representation of the sequence of the development of body awareness in the pre-school child:

Age	Capability
2-3 years old	• Awareness of the concepts: front, behind, next to, head, feet. • The child can find objects according to these body references. • Awareness of other parts of the body increases e.g. thumb and hand and he/she becomes familiar with the face.
4 years old	• Awareness of the two-sidedness of the body. • The child cannot yet localise the two sides of his/her body. • Knowledge of body parts improves.
5 years old	• Knowledge of the right and left sides of the body, but uncertainty about the precision thereof. • Ability to determine the positioning of the self in relation to other objects and vice versa.
6 years old	• Distinguishes between right and left sides of body parts. • Begins to determine the body position with reference to the right and left sides of objects and vice versa.

Together with the development of the body awareness of the child, laterality and dominance develop which are key aspects of temporal-spatial orientation (Kok, 1975).

Laterality is the internal awareness of right and left and forms the basis of movement of the body in the horizontal plane. Laterality enables the child to be aware of the body knowing which side is involved in movement, when movement occurs and how far the movement is situated from the midline (Grove, 1986). Kephart (in Cratty, 1970) defined laterality as "the ability to co-ordinate the right and left sides of the body and to cognitively differentiate between both sides" (p.250). An awareness of laterality is essential for spatial coordination, movement and motor activities (Kok, 1975). The development of laterality in the pre-schooler has been associated with scholastic and cognitive skills (Cratty, 1970). Kephart (in Grove, 1986) related inefficient development of laterality to the cause of strephosymbolia which is associated with reading problems (Williams, 1983).

Spatial Awareness

Spatial awareness is a basic component of perceptual-motor development that may be divided into two sub-categories:

- Knowledge of how much space the body occupies
- The ability to project the body effectively into external space.

Knowledge of how much space the body occupies and its relationship to external objects may be developed through a variety of movement activities. With practice and experience, children progress from their egocentric world of locating everything in external space relative to themselves (egocentric localisation) to the development of an objective frame of reference (objective localisation). For example, pre-schoolers tend to determine the location of an object relative to where they are standing. Older children, however, are able to locate an object relative to its proximity to other nearby objects without regard to the location of their body (Gallahue, 1989).

Children learn that there are three types of space in which they can move. Their self space, or personal space as it is often called, is the area immediately surrounding their body. General space refers to the total available space in the room, gymnasium or on the playground. Restricted space is a specifically prescribed or limited area in which they may move (Gallahue, 1989).

Directional Awareness

Directional awareness refers to the internal awareness of the two sides of the body (laterality) and the ability to identify dimensions of external space (directionality). It is through these elements that the child is able to understand the dimensions of space (e.g. the child is able to understand the dimensions of space (e.g. left/right, up/down, in/out, front/back/sideways) and move the body through self-effort and guidance (Williams, 1983; Overby, 1992). According to Gallahue (1989) directionality depends on adequately established laterality which are important readiness skills necessary for success in reading.

Temporal Awareness

Temporal awareness is concerned with the development of an adequate timing structure in children. It develops simultaneously and concurrently with spatial development in the child. Temporal awareness is intricately related to the coordinated interaction of various muscular systems and sensory modalities. The terms "eye-hand-coordination" and "eye-foot coordination" reflect the interrelationship of these processes. The child with a well-developed time dimension is referred to as coordinated, being able to synchronise movements in a rhythmical manner putting them into a proper sequence (Gallahue, 1987). Rhythm is the basic and most important aspect of developing a stable temporal world in children. Gallahue (1989) advocates rhythmic awareness activities that require performing movement tasks to auditory rhythmic patterns for young children.

Vestibular Perception

Vestibular perception provides information about the body's relationship to gravity via the vestibular apparatus located in the inner ear. It, thus, serves as the basis for the body's sense of body position as it relates to stability or balance. Balance refers to the ability of the pre-schooler to control the body in a stationary and a dynamic position. According to Cratty (1970) balance is the ability to maintain equilibrium amidst unstable circumstances. The balance ability and body orientation from an unstable base purports accurate perceptual and spatial judgement. Efficient balance ability seems to be essential for

the development of laterality of the young child which could be associated with the scholastic skills of reading and writing (Grove, 1986).

Visual Perception

The child's abilities to judge depth, distance and to distinguish an object from its surrounding background (figure-ground discrimination) are primary contributors to the perceptual information needed for successful motor performance. According to literature approximately 75% of the information derived from the environment is in the form of visual stimuli. Visual perception is described by Grove (1986) as the ability of the brain to make contact with the outside world through the eyes. Accurate visual perception is crucial for the acquisition of reading, writing and drawing skills. As an important aspect of sensory-perceptual development, it includes visual discrimination, memory and integration (Grove, 1986; Super, 1979). Because one of the research questions of the current investigation is focused on visual-motor integration, more detail about visual perception will be dealt with in a separate section of this review of literature.

Auditory Perception

Auditory perception is based on the abilities of auditory discrimination, sound localisation and auditory figure-ground perception. Auditory perception is more than hearing. It involves the ability to translate what one hears into meaningful information (Moran & Kalakian, 1979). Auditory perception is the contact the brain makes with the outside world via the ears (Super, 1979). According to Kok (1975) auditory perception fulfils an important function in the learning process and is central to all language issues. A child having difficulty with auditory perception will have difficulty with auditory memory and auditory discrimination (Faas, 1981; Grove, 1986).

Summary of the Components of Motor Development

Research has established that the development of gross motor coordination determines the acquisition of gross motor skills and is indispensable to any subsequent efforts to participate in sport (Charlop & Atwell, 1980). Shortcomings in perceptual-motor components such as laterality and right-left discrimination, for example, may lead to poor gross motor coordination (Pienaar, 1992). In this context, motor coordination refers to the

integration of force and speed in the fluent, rhythmical and accurate execution of time and distance of an object in relation to one's body (Salkind & Ambron, 1987).

One example of a perceptual-motor component regarded as critical for normal sequence and rate of motor development is that of eye-hand coordination. It is the ability of the child to follow movements visually and execute responses or actions manually. It enables the child to execute everyday activities such as getting dressed, writing and participating in sport activities (Grove, 1986). Poor eye-hand coordination limits the ability to write, draw, cut and play with a ball utilising fine muscle groups of the body (Grove, 1978). Another developmental component of perceptual-motor functioning, eye-foot coordination, refers to the ability to execute movements of the foot being visually used. A child with deficient eye-foot coordination would have difficulty in activities wherein the eye and foot work together such as kicking a ball. This latter skill is important in speed orientated games and on the affective and social dimensions for acceptance by peers (Duda, 1987, Salkind & Ambron, 1987; Weingarten, 1980; Wiegersma, 1980). Eye-hand coordination and foot-eye coordination are often referred to under the broader term of "visual-motor integration".

Motor Development Disorders

Difficulties with motor development are anticipated for children with clinically defined disabilities such as cerebral palsy, visual impairments, and even measurable intellectual impairments. However, there are children whose motor development is considerably below that typically observed in children of similar chronological age for no apparent reason. These children usually exhibit "soft" and/or "hard" neurological signs - an observable or measurable behaviour that indicates that one or more of the systems that support movement coordination are not functioning optimally (Mc Graw, 1963; Paine & Opper, 1966; Prechtl, 1977; Prechtl & Beintema, 1964; Williams, 1983)

In the normal pattern of development of the central nervous system, for example, maturation progresses throughout infancy, allowing the typical gross and fine motor milestones, e.g. creeping, walking, prehension, etc., to evolve sequentially and provide the basis for future skills. Reflexes play an essential part in motor development, with voluntary movements superimposed on the underlying reflexive base. As lower central nervous

system level reflexes are inhibited and higher reflexes appear, the child becomes able to do more complex motor tasks, including those involving balance (Connolly, 1984; Weeks & Ewer-Jones, 1983). Central nervous system dysfunction, however, including deficits in sensory processing, can lead to inadequate fine and gross motor functioning and to perceptual and cognitive disorders that may be manifested in learning disabilities (Weeks & Ewer-Jones, 1983). Without obvious pathological conditions, some of the children with learning difficulties, exhibit significant movement difficulties and lack of coordination causing crude performance of locomotor and manipulative skills (Miyahara, 1994). Delays in the functional skills that enable children to control their environment are evident and these children lag behind their peers in all or some of these functional skills, which greatly reduce their level of participation in everyday school activities (Wright & Sugden, 1996a & b).

Keogh (1982) proposed that children who experience problems in acquiring skilled movements have a movement learning disability in the same sense that some children are identified as having learning disabilities in other area such as reading, spelling or arithmetic. For these children, the inclusion of remedial movement may be just as valid as remedial reading, writing or arithmetic (Arnheim & Pestolesi, 1973; Maeland, 1992). Children with a marked impairment in the development of motor coordination that is not explainable by mental retardation or a known physical disorder are described as having Developmental Coordination Disorder (DCD) (Wright & Sugden, 1996a & b). The diagnosis is made only if this impairment significantly interferes with routine activities of daily life or with academic achievement. The manifestations of this disorder have been given many titles such as developmental clumsiness (Gubbay, 1975), dyspraxia (Denckla, 1984), perceptuomotor dysfunction (Laszlo, Bairstow, Bartrip & Rolfe, 1988), and movement difficulties (Sugden & Keogh, 1990), with the term clumsy being the most prevalent.

The heterogeneity of children with motor coordination problems have been well documented. Within the descriptive literature, problems with gross motor tasks such as standing on one leg and hopping are mentioned as frequently as problems with catching a ball and fine motor skills such as fastening buttons, drawing a triangle and using a knife and fork (Arnheim & Pestolesi, 1973; Gordon & McKinlay, 1980; Gubbay, 1975; Henderson & Hall, 1982; Hoare, 1994). Research efforts have also attempted to identify processing deficits that might underlie poor gross and fine motor performance. Investigation of links

between problems of perception and impairment of movement, has included kinaesthesis (Bairstow & Laszlo, 1981; Laszlo & Bairstow, 1985; Laszlo, et al. 1988) and vision (Hulme, Biggerstaff, Moran & McKinlay, 1982; Hulme, Smart & Moran, 1982; Lord & Hulme, 1987, 1988a & b).

Gubbay (1975) and Lord and Hulme (1987) noted sensory problems and Laszlo et al. (1988) highlighted kinaesthetic problems, while Smyth and Glenncross (1986) suggested that children with DCD are deficient in speed of processing kinaesthetic information but not in speed of processing visual information. Van Dellen and Geuze (1988) found that children with DCD are slow but not inaccurate in the process of response selection; this is also supported by Rösblad and Von Hofsten (1994), who reported both slowness and variability of response in the use of visual information in goal-directed arm movements.

Dwyer and McKenzie (1994) concluded that children with DCD differ from non-developmental coordination disorder children in their ability to remember visual patterns over a brief time lapse, but immediate recall does not differentiate the children. Mon-Williams, Wann and Pascal (1994) found that ophthalmic difficulties alone cannot explain the difficulty children with DCD have with motor control. Geuze and Kalverboer (1987) reported that the latter children are inconsistent in controlling temporal aspects of their movements and are imprecise in a finger aiming task. Wann (1986, 1987) proposed that these children demonstrate poor handwriting because the underlying mechanisms for the organisation of this skill are inadequate for the sophisticated movements required. Laszlo and Bairstow's (1985) work examined underlying processes felt to support more task-specific skills performed by these children. Laszlo and Bairstow claimed that improvement to the deficient underlying processes transfer positively to increased performances of functional tasks.

The movement difficulties that children with DCD experience during their early years continue to have an effect into teenage years (Geuze & Börger, 1993; Losse et al. 1991). Cantell et al. (1994), through a longitudinal study, found that children identified at age five years to have movement difficulties, separated into two groups 10 years later, a stable clumsy group and an intermediate group who can no longer be clearly distinguished from the control group or the stable clumsy group. The children from the stable clumsy and intermediate groups differ at age 15 years for academic ambitions, social hobbies and

opinions of self-worth. The characteristics associated with DCD are plentiful and are not confined simply to the more noticeable motor skills. There are social and affective concomitants that can detract from the child's academic progress (Henderson, et al. 1989; Losse et al. 1991).

Assessment of Gross Motor Development

The assessment of gross motor development is an essential component in planning and providing movement education programmes. There have been many measurement instruments designed to assess motor development. A majority of these instruments have been focused on the identification and classification of children who may be slow learners, neurologically impaired or have attention deficit disorder (Gallahue & Ozmun, 1995).

Assessment Strategies

A variety of assessment strategies have been developed to measure motor skill performance as an indicator of developmental status. There have been a number of reviews of these instruments (Davies, 1984; Henderson, 1986; Laszlo & Bairstow, 1985). Some of these tests are normative screening tests directed at identifying children who experience difficulties in the motor domain. These norm-referenced tests rely primarily on product scores and focus on what the child can and cannot do. Performance expectations are determined according to chronological age. Another group of tests are the criterion-referenced tests which study how children perform a task. Performance is judged against an established criterion pattern for movement mechanics. These types of assessments are intended to lead to recommendations for remediation (Maeland, 1992).

There have been methodological problems encountered in the assessment of gross motor development. Several investigations have focused on whether there is any agreement among classroom teaches in the identification of "clumsy" children. Gubbay (1975) asked teachers to evaluate a groups of children by completing a seven-item questionnaire that included questions on sporting ability and general clumsiness. Keogh, Sugden, Reynard and Calkins (1979) compared three assessment procedures: a teacher questionnaire, observational ratings by physical education specialist, and a motor test. They reported no substantial agreement on the criteria for identifying "clumsiness" among these three procedures. On the other hand, Henderson and Hall (1982) found a significant relationship

among the results of teachers' rating, performance on a motor test, and a neurodevelopmental examination on the identification of children with motor coordination problems.

Other methodological problems have stemmed from disagreement about the causes of motor development problems. Some researchers consider that specific motor dysfunctions are the primary cause of movement development problems, such as dyspraxia (Denckla, 1984) or kinaesthetic "disability" (Laszlo & Bairstow, 1985). Other researchers disagree with the idea that any single factor causes motor impairments. Henderson and Hall (1982), for example, found that the movement characteristics of children with motor coordination problems vary widely. Hulme et al. (1982 a & b) emphasised that the heterogeneity among children with motor coordination problems pointed out the need to differentiate subgroups among so-called "clumsy" children.

There has even been a debate about using general concepts of motor ability to help define what kinds of items belong in any assessment instrument. Hoare (1994) and Lyytinen & Ahonen (1988) suggested that movement tasks ought to be assessed independently, assuming skill specificity. Rather than determining a composite score for a child, an individual profile of his/her performance was recommended to specifically identify motor performance strengths and weaknesses. More recently, children with motor coordination problems have been classified based on their performance of both fine and gross motor functions (Hoare, 1994; Lyytinen & Ahonen, 1988). As Stott, Henderson and Moyes (1986) have pointed out:

> We no longer assume motor ability as a fixed unitary capacity, or even that it can be broken up into a number of component abilities with which children are endowed in varying degrees (p. 206)

It can be concluded that the assessment of children's motor development is a complex endeavour that may require different measurement approaches (Maeland, 1992).

Assessment Instruments

Sloan (1955) proposed that a motor coordination assessment instrument should sample a wide range of motor abilities. MacIntosh (1974) identified five general motor abilities that underlie gross motor skill, namely: agility, balance, coordination, flexibility and speed of movement. Bruininks (1978) supported the identification of these five abilities as primary components of gross motor development. Two of the most commonly used assessment instruments reflect both the common pattern in instrument design, and the problems associated with application of the instrument:

The *Denver Developmental Screening Test*

This test provides scores for gross motor, language, fine motor and personal-social skills and yields an overall developmental profile. It has been criticised for being standardised on a mostly middle-class, white population and it can be administered to individual children only (Meisels, 1986). Meisels (1986) emphasised that standardised tests should not be used in multicultural/multilingual communities if they are not sensitive to the effects of cultural diversity or bilingualism.

The *Bruininks-Oseretsky Test of Motor Proficiency* (Bruininks, 1978)

This tests contains 46 items and is burdened by the use of special equipment which limits cost-effectiveness. Charlop and Atwell (1980), in administering the Bruininks scale found that the test lacked differentiation of levels of motor coordination amongst younger children aged 4 to 6. The revised version of the Oseretsky motor development scale consists of 36 items which makes it tedious to administer, time consuming and lacking in standardisation. The revised scale also requires special equipment for administration (Kerschner & Dusewicz, 1970).

Henderson (1986) determined that most existing tests of motor coordination seem to fall short in that they lacked either acceptable validity, reliability, or standardisation, and they were often too time-consuming to administer or required expensive special equipment. The *Movement Assessment Battery for Children* (ABC) included both a checklist and a formal set of tasks for evaluation (Henderson & Sugden, 1992). *The Movement ABC*

Checklist assists teaching in examining the incidence and nature of motor problems in children (Wright, Sugden, Ng and Tan, 1994). A developing picture of the movement difficulties and related clumsiness of a child is obtained and can be usefully employed in consideration of an intervention programme. The *Movement ABC Test* is norm-referenced and contains items designed to assess manual dexterity, ball skills and static and dynamic balance specifically oriented to the identification of children with Developmental Coordination Disorder (Henderson & Sugden, 1992, Wright et al. 1994). It is a revision of the Test of Motor Impairment (TOMI) devised by Stott, Henderson and Moyes (1986.

Although many of the motor development assessment instruments can identify a child who can perform tasks at or above age level, very few differentiate superiority in coordination on appropriate age-level items. A finer distinction is needed to compare children in terms of the quality of their performance on appropriate age-level items, especially when working with so-called "normal" children, most of who could be expected to meet normative standards. The Charlop-Atwell Scale of gross motor coordination was developed to measure the five primary abilities as well as address the problem of distinguishing difference in coordination in performance (Charlop & Atwell, 1980). Charlop and Atwell (1980) believed that the assessment of gross motor coordination should include an evaluation of the quality of the performance, not just the ability of the child to perform certain tasks. Since an objective score alone does not reflect the fineness or smoothness of performance of a task, it does not differentiate between two children who could both perform the task but not with equal ease and precision of movement. This quality of performance is an important dimension which has been excluded from the existing motor coordination scales.

For the purpose of the present investigation, a test to assess gross motor development was needed that could be administered in the field in a reasonably short period of time, and that would not over-tire or bore the young children. The Charlop-Atwell Scale of gross motor coordination was selected because in addition to meeting these practical considerations, it contains an objective sub-test to measure the accuracy of performance and a subjective sub-test to measure the quality of performance of a motor task. The scale is quick and easy to administer and very cost-effective as no special equipment is required. Provisional norms have been established together with checks for reliability and validity.

Because the Charlop-Atwell scale was designed to measure gross motor coordination, the six items selected are geared toward the utilisation of the entire body. These items are selected primarily for indicating a developmental trend in performance and manifesting individual differences within each age level. All six items appear to be intrinsically motivating and enjoyable for the children, accommodating the characteristic short attention span of young children. Emphasis is placed on the quality of performance of each item. The rationale for the selection of each item included in the test battery will be presented in the following chapter in this study.

Summary of Assessment of Gross Motor Development

The assessment of the gross motor development of young children might help identify relevant instructional objectives and content in terms of their movement education. Motor coordination assessment procedures could also assist in the evaluation of the effectiveness of remedial motor programmes (Brown & Kenyon, 1968). The results of research conducted with children with movement difficulties has been mixed, in part due to the lack of clear-cut criteria or agreed-upon methods for the identification of children with problems (Sugden & Keogh, 1990; Missiuna, 1994).

It is important to note within the context of this study, it was not presumed that children from disadvantaged communities necessarily have coordination difficulties. However, the causes of most coordination difficulties have been found within the domain of gross motor development Smythe & Glencross, 1986; Geuze & Kalverboer, 1987; Hoare, 1994. It is important to recognise that many children who have gross coordination problems have also demonstrated academic and behavioural problems. This relationship underscores the importance of determining children's gross motor development status, identifying any problems, and then designing effective movement programmes to stimulate development and/or provide remedial activities that will address problems where they exist. Children from disadvantaged communities are considered to be "at-risk" in terms of normal patterns of development, and thus it was considered appropriate to assess their gross motor coordination.

Keogh (1982) stated that motor performance can be measured in many ways and from many different perspectives. The question then arises whether it is possible to select a

single assessment instrument to cover the wide range of motor skills development. For the purpose of this investigation with its emphasis on expressive movement as content and young children from disadvantaged communities as subjects, the Charlop-Atwell Scale (1980) was selected as one of the assessment instruments because it allowed the investigator to quickly and effectively assess motor coordination differences among children in their performance of representative movement tasks.

Visual-Motor Integration

During the pre-school years children develop their early perceptual-motor skills and refine both their gross and fine motor abilities. The role of perception in gross and fine motor skills development is readily apparent. Without accurate sensory input and the ability to interpret sensations, it is difficult to develop motor skills. As movement occurs at large and small joints of the body, proprioceptive and tactile sensations aid in the perception of position and movement. Such incoming sensations also help in the development of a body scheme. The vestibular system responds to head movements, and information produced by this system helps control ocular movements and postural reflexes. Vision works along with proprioceptive sensations to allow for the perception of movements and their correction. Auditory input contributes to feedback about the speed, rhythm and success of the intended movement (Talbut & Junkala, 1981; Weeks & Ewer-Jones, 1983).

Rösblad and Von Hofsten (1994) and Mon-Williams, et al. (1994) supported the model that identifies skilled motor behaviour as the product of an interaction between perceptual and motor processes. Within this model, some form of inter-sensory or cross-modal linkage is proposed between perceptual modalities that enables transfer of information (Dwyer & McKenzie, 1994). For example, in order to initiate movements on the basis of visual information, the existence of a translation process between visual and kinaesthetic information has been is postulated.

Visual Abilities

Various deficits in the functioning of the perceptual systems of children with movement difficulties have been investigated. Research refers to children with movement difficulties as having visuo-motor disability (Frenner & Gillman, 1966), visuomotor incoordination, perceptual-motor disorder (Gordon & McKinlay, 1980) and/or developmental apraxia and agnosia (Gubbay, 1975). Hulme and colleagues (Hulme et al. 1982a & b; Lord & Hulme, 1987, 1988a & b) proposed that visual perceptual deficits play a key role. Laszlo and colleagues (Bairstow & Laszlo, 1981; Laszlo & Bairstow, 1985; Laszlo et al. 1988 Bairstow, Bartrip & Rolfe, 1988a & b) emphasized deficits in kinaesthetic perception; and Hoare (1994) argued that both kinds of perceptual deficits often occur simultaneously in the same children.

Adequate visual perception is necessary for movements to be guided in relation to the environment with specific reference to the perception of distance and spatial relationships (Hulme et al. 1982). Hulme et al. (1982) assessed the importance of perceptual impairments as determinants of movement difficulties and found that children with movement difficulties were consistently less accurate in their visual, kinaesthetic and cross-modal judgements of length than children without movement difficulties of the same age and verbal intelligence. The correlation between performance in the visual condition of the task and motor ability was substantial, while performance in the kinaesthetic and cross-modal conditions did not correlate with motor ability. The authors concluded that difficulties in the visual perception of distance and spatial relationships may be an important determinant of the poor motor co-ordination of the child with movement difficulties. Because it is often impossible to assess whether difficulties in performing such tasks as drawing, threading beads and cutting are caused by fine motor or perceptual dysfunction or both, the terms visuomotor integration or motor/perceptual integration are used when referring to visually guided movements (Rasmussen, Gilberg, Waldenström & Svenson, 1983).

Visual-motor integration is one of the foundations of perceptual-motor development. Williams (1983) defined visual-motor integration as the ability to co-ordinate specific visual input with a specific motor output or response. Visual-motor integration is

also referred to as eye-hand coordination that encompasses fine motor control, involving a close functional relationship between the use of the eyes and the small muscle masses of the hand, that depends upon two primary visual abilities (visual discrimination and visual memory) as well as the development of visual-motor integration itself (Williams, 1983).

Visual Discrimination

Visual discrimination refers to the ability to identify similarities and differences when observing objects in order to identify and classify them (Grove, 1986; Salkind & Ambron, 1987). Visual discrimination consists of prominent characteristic discrimination and figure-ground discrimination. "Prominent characteristic discrimination" assists the child in differentiating between colours, shapes, patterns, sizes, directions and texture. An awareness of these characteristics of objects ascertains identification, classification and selection of objects. "Figure-ground discrimination" is the perceptual ability to distinguish between relevant and irrelevant stimuli. Problems with figure-ground discrimination could cause difficulty in positioning words while reading, recognising objects, finding a specific word in the dictionary and interpreting stories and social situations (Faas, 1981).

Visual acuity is an important variable in visual discrimination. It refers to the capacity of the visual system to detect or perceive detail clearly. Acuity is related to basic discrimination processes involved in visual pe· ption. Improvements in visual acuity with age and/or experience often accompany an increase in the child's capacity to make more refined visual discriminations. Accurate visual discrimination is essential for scholastic progress. It is of utmost importance that the ability for visual discrimination be effectively developed. Opportunities for the pre-schooler to build puzzles and sorting objects according to colour, type, shape and texture are standard approaches for developing this critical ability (Faas, 1981; Grove, 1986).

Visual Memory

According to Grove (1986) visual memory is the ability to remember what the eyes have detected. Two types of visual memory have been identified: re-visualisation and sequential visual memory. Re-visualisation is the visual process which leads to effective visual memory allowing the child to recall and reproduce letters and words. Children having problems with re-visualisation cannot recall visual images of letters or numbers from

memory (Faas, 1981). Sequential visual memory refers to the ability to recall successive items from memory. Children having difficulty executing a sequence of demonstrated activities in a specific order could suffer from inefficient sequential visual memory. They experience difficulty in:

- ordering shuffled pictures, beads and words
- ordering pictures, sentences and words to represent the accurate order in which the story was told
- recalling the order of letters in spelling of words
- recalling already acquired knowledge (Faas, 1981).

A child suffering from inefficient visual recall would have difficulty in recalling and reproducing visual experiences. The ability to recall content visualised is a prerequisite for successful reading and learning.

Visual association is a variable that influences visual memory. It refers to the ability of the child to recognise shape and sizes. It includes the ability of the child to determine that an object situated further away only appears to be smaller in size (Grove, 1978). Children with visual association problems have difficulty matching pictures according to similarities. They also have difficulty identifying similarities and differences in visual stimuli and ascribing meaning to letters, numbers, words and symbols (Faas, 1981). Visual association is an essential factor for the acquisition of reading ability as the child needs to be able to recognise letters, words and numbers as well as their shapes and sizes (Grove, 1986).

Developmental Considerations and Visual-Motor Integration

In terms of normal sequences of development, visual discrimination abilities appear first and seem to provide the foundation upon which the other visual-perceptual abilities are built. For example, five- and six-year olds have much less well developed static visual acuity than older children. From five to seven years of age a period of rapid improvement in static visual acuity occurs which is followed by a period of relatively little change from seven to nine years of age (Cratty, 1979). The development of visual-motor integration abilities begins shortly after the emergence of visual discrimination abilities, and undergoes

progressive refinement throughout early and middle childhood years. Visual memory processes, although the last of the abilities to reach high levels of refinement, also appears early in development and continues to undergo refinement over several decades (Williams, 1983).

An important variable that influences visual-motor integration is the perception of spatial orientation. Spatial orientation refers to the ability of the child to recognise, identify, or simply be aware of the position or orientation of objects in two-or three-dimensional space (Williams, 1983). Perception of spatial orientation seems to begin with the child becoming aware of the basic dualism that bisects all of space. At three to four years, children become much more aware of spatial dualism and learn such spatial opposites as in/out, vertical/horizontal, top/bottom, front/back, etc. Until the child begins to develop some sensitivity to these spatial opposites, he/she is likely to get things inverted, reversed or rotated in getting them properly positioned in space (Williams, 1983). An essential aspect of the development of awareness of spatial dualism is the mastery of spatial direction. Children appear to master spatial directions in an orderly sequence, moving from mastery of the vertical to the horizontal to the diagonal or oblique (Beery, 1982).

Chronological Age and Development

Because the structures that support visual perception are different for children of different ages, any analysis, assessment or attempt to enrich visual or visual-motor abilities in young children must take into account the chronological age of the children involved (Williams, 1983). Frostig (1964a & b) identified the development of visual-motor control in the form the ability to co-ordinate the use of the hands and eyes skilfully, as one of the five basic processes that are essential in the child's early visual perception development. Information from Frostig's research on the standardisation of the Developmental Test of Visual Perception (1964 b) clearly indicated that the age span from three to six years is a time of both rapid and significant change in visual perception abilities. Improvements in perception of figure-ground relationships and position in space occur primarily from four to six years. The period from five to seven years is one of rapid growth in the perception of spatial relationships. All of these visual perception processes then seem to decelerate and reach an asymptote in growth at about nine or ten years of age. With reference to the

development of visual-motor integration, a steady almost linear improvement in this integrative aspect of visual perception occurs from age five to ten years.

Gender Differences and Development

Sapir (1966) found gender differences in perceptual-motor development of pre-schoolers. In tests of four and a half year old children who were re-tested nine months later, boys were found to mature faster than girls but still did not reach the developmental level of the girls on any perceptual task. Boys gained most in visual discrimination during the time span and girls progressed most in auditory discrimination, memory and visual-motor spatial relationships. However, in a more recent review of research, Williams (1983) found no gender differences for the development of visual-motor integration.

Martin et al. (1969) developed a perceptual development test and studied patterns of developmental trends in perceptual functions in 160 children ages three to 10 years. They assessed visual, tactile, kinaesthetic, haptic and auditory perception, as well as motor performance. They found that no percent of perceptual growth has occurred by the time the child is three to four years old, 20 percent more o[illegible] ages four to seven, and another 10 percent between ages seven and ten. Th[illegible]parently a period of perceptual latency in some areas between age five and six, with no performance change on several auditory sub-tests or in a test of visual recognition of shape and size during this period. On sub-tests requiring a combination of visual skills (appreciation of shape, size and form; rotational changes of more than one component; and analysing embedded and superimposed figures), it was found that children below six years of age are unable to integrate these skills sufficiently to perceive the visual stimuli accurately, in this research, perceptual performance was related to socio-economic status until after age six years, suggesting that school and other experiences help the delayed child to advance to age-appropriated levels. Interestingly no performance differences between males and females were found at any age. Performances in the visual, auditory and somatosensory modalities were divergent except at eight years of age, which suggested to the researchers that this might be a period of sensory integration.

The Assessment of Visual-Motor Integration

A number of developmental factors enter into the evaluation of motor abilities because many underlying sensory, motor and perceptual functions must be adequate to ensure that motor performance will be coordinated (Weeks & Ewer-Jones, 1983):

1. Anatomical structure must permit freedom of movement.
2. Muscle control must be sufficient to produce smooth, unhindered movement.
3. Proximal joint stability must be established before distal fine motor control is possible.
4. Postural control must be sufficiently developed to enable the successful performance of selected motor tasks and skills.
5. Sensory abilities must be sufficiently refined to allow the child to utilise various proprioceptive, visual and auditory stimuli as information for determining motor performance.
6. Attitudes and emotions can also positively or negatively affect motor performance.

It is common in the developmental assessment of pre-school age children to rely on charts and lists for comparison with age-appropriate behaviours in each area of development. Fine motor development follows a predictable sequence, as does gross motor development (Weeks & Ewer-Jones, 1983). Obvious difficulties exist in attempting to measure visual-motor integration capacity in pre-school children as the range of visual-motor activities is expected to be limited. Blair and Jones (1960) observed that any test which appraises a child's capacities, achievements and attitudes provides some basis for estimating or predicting growth and development in the areas measured.

Drawing geometric designs is a task frequently used in the assessment of fine motor coordination or visual-motor integration (Ayres, 1972; Cantell et al., 1994; Gesell, 1973; Ilg & Ames, 1972; Knobloch & Pasamanick, 1974; Lowder, 1956; Missiuna, 1994; Telzrow & Harlage, 1981). The Beery Developmental Test of Visual-Motor Integration has been

selected for the purpose of this investigation. A whole programme has been developed for the assessment and remediation of fine motor skills based upon this developmental test (Beery & Buktenica, 1967). The child visually focuses on each design and then copies it. Figure-ground perception, position in space, spatial relations and fine visual motor integration and coordination are skills needed to complete the test.

Projective drawings have been used to assess creativity and intellectual maturity in children, but also to assess visual-motor development, personality characteristics, neurological impairment and to identify children with emotional problems (Cicirelli, Granger, Schemmel, Cooper, Helms, Holthouse & Nehls, 1971; Goldman & Warren, 1976; Reynolds, 1994; Thomas & Silk, 1990). Goodenough (1926) was the first to develop and standardise an approach to evaluating children's intelligence through their drawings of a man, i.e. the Goodenough Draw-a-Man Test. By crediting children at different chronological ages with (1) points for the characteristics or details included in their drawings, and (2) points for their drawings' qualitative maturity, Goodenough was able to quantitatively assess their intellectual functioning and derive individual intelligence estimates.

In the Goodenough-Harris scoring system, children's drawings of a man and/or woman are given points for the presence of specific characteristics, e.g. parts of the body, clothes, accessories; for the quality of the drawing, e.g. appropriate and well-drawn lines and angles within the figure, good proportionality between different body parts such as head and trunk; and for the integration of figures into whole, recognisable persons. These points are entered as raw scores into norm tables, which are separated by the sex of the figure drawn, the sex of the child completing the drawing, and the chronological age of the child. This technique was updated by Harris (1963), providing a more recent set of standard scores related to children's intellectual maturity.

The Bender-Gestalt test utilises Werheimer's figures selected on the basis of Gestalt principles of organisation, to assess children's intellectual development and visual-motor integration. Developed by Bender (1938), the test consists of nine geometric drawings that are presented individually to children in a standard order, with directions to reproduce them on paper with pencil as accurately as possible. The Koppitz scoring system (1964) was developed especially for assessing children's reproductions. In this method of scoring

possible errors due to rotation of the figures, incomplete angles, perseveration and distortion of shape, are recorded. An item analysis of Bender-Gestalt errors of children aged six to 11 to establish maturational changes in visual-motor perception, revealed that kindergarten children should be excluded as their ability to reproduce Bender designs is so poor that the test is of questionable use (Tolor & Schulbert, 1963).

Considering the intensity and duration of individualised assessment and the possibility that some drawing tests are culturally loaded approaches to assessment, the Developmental Test of Visual-Motor Integration (Beery, 1967; 1982) was selected as a suitable measure for the purpose of the current investigation. The Developmental test of Visual-Motor Integration (DTVMI) is a series of 24 geometric forms, arranged in order of increasing difficulty, copied with pencil and paper, is used for psychomotor and developmental assessment of children in pre-school and early primary grades (Hartlage & Lucas, 1976). Schlodder (1986) considered the DTVMI as a culture-fair, developmentally based test yielding age equivalent Visual-Motor Integration Scores (VMI scores), which makes it an ideal instrument to use in the multi-ethnic South African society. The correlation between VMI scores and chronological age is .89 for the two-to-fifteen age range. VMI correlations are higher with mental age than with chronological age. Correlations with mental age and chronological age are higher in first-grade children than in older children (Beery, 1982). Scores of kindergarten children and children with intellectual impairments have improved following perceptual-motor training (Beery, 1982).

Summary of Visual-Motor Integration

Research had shown that children with movement difficulties experienced difficulty in exercising the fine motor skills involved in drawing and reproducing geometric patterns (Dwyer & McKenzie, 1994; Laszlo & Broderick, 1985; Lord & Hulme, 1988b). The documentation of the relationship between gross motor skill performance and the development of visual-motor integration provides rationale for the provision of comprehensive movement education programmes for children, as well as for use of appropriate assessment instruments to help identify the factors which may contribute to a lack of age-appropriate skilfulness in motor skill performance. The Beery Developmental Test of Visual-Motor Integration was selected for use in this study because it can be administered quickly and easily, has also been used previously in research with young

children to determine the effectiveness of perceptual-motor training programmes (Beery, 1982).

Impairments in visual-motor integration can contribute to scholastic failures which may mistakenly be attributed to laziness or lack of co-operation (Brenner & Gillman, 1966; Frostig & Maslow, 1970). The resultant frustration both at home and at school can create emotional problems, which may further complicate the situation. Children with visual-motor integration problems are not always easy to recognise, especially if their verbal intelligence is high and if they have made some compensation for their perceptual difficulties (Brenner & Gillman, 1966). The participation of children in movement education programmes is one way to provide meaningful challenges for both gross and fine-motor skill performance that offers opportunities for the active practise and refinement of visual-motor integration.

Self-concept

In this investigation self-concept will be used as the umbrella term under which several conceptions of self are categorised. Self-concept is generally viewed as one's awareness of personal characteristics, attributes, and limitations and the way in which these qualities are both like and unlike others. Self-concept is one's view of self and self-esteem is the value one attaches to his or her unique characteristics, attributes and limitations (Gallahue & Ozmun, 1995). Weiss (1987) indicated that "self-esteem represents the evaluation and affective component of one's self-concept: that is it refers to the qualitative judgements and feelings attached to the descriptions one assigns to self" (p. 88).

Models of Self-concept

Pangrazi (1982) presented the self-concept as a system of ideas, attitudes, values and commitments which constitute a person's inner world. The self-concept is a person's total appraisal of her appearance, background and origins, abilities and resources, attitudes and feelings which culminate as a directing force of behaviour. In their review of several major theoretical perspectives of self-concept, Winne and Marx (1981) found consensus pertaining to three aspects:

1. Interaction with "significant others" strongly influences the development of one's self-concept.

2. Self-concept comprises at least three and sometimes four differentiable facets corresponding to how individuals view themselves in specific situations (typically these include academic, social, physical and sometimes emotional dimensions).

3. The relationship between self-concept and other external variables is nonrecursive.

The major disagreement found in the literature by Winne and Marx (1981) concerned the structure of the theoretical models proposed to explain self-concept. They identified four different types of theoretical models of self-concept.

The first and oldest perspective may be referred to as the nomothetic position (Soares & Soares, 1982). This view proposes that self-concept is perceived by the individual as a uni-dimensional. Accordingly, characteristics descriptive of self-concept are used to explain one's behaviour in various settings. Although few in number, studies that establish self-concept as a unitary phenomenon that is generalised, are present in the literature (Rosenberg, 1965; Rosenberg, 1979).

A second theoretical perspective of self-concept has been termed the hierarchical model (Winne & Marx, 1981). This model was originally proposed by Shavelson and colleagues (Shavelson, Hubner & Stanton, 1976) and has received partial support in the literature (Byrne, 1984; Shavelson & Bolus, 1982). This theoretical position proposed that the multiple facets of self-concept may be ranked in a hierarchy. At the base of the hierarchy are the situation-specific self concepts and at the apex is general self-concept. It is argued that general self-concept is the most stable facet with exhibited decreasing stability upon descending the hierarchy toward specific situations. The hierarchical model parallels in many ways Vernon's (1950) model of intelligence.

A third theoretical view of self-concept supports the notion that self-concept is structured in a series of several highly specific factors. This perspective has been termed the taxonomic model (Soares & Soares, 1983) and is analogous to the traditional theories of intelligence. Within this model, facets of self-concept may be relatively independent of each other. Soares and Soares (1982), however, noted evidence that a basic general factor may

exist in addition to the semi-autonomous specific factors. Several studies have established self-concept within the taxonomic framework (Marx & Winne, 1975; Soares & Soares, 1982; Winne, Marx & Taylor, 1977; Winne Marx, 1981)

The fourth theoretical position regarding the structure of self-concept has been proposed by Winne and Marx (1981) and may be termed the compensatory model. This perspective, in agreement with the hierarchical and taxonomic models, supports the notion of a general dimension to self-concept. However, the compensatory model suggests that the specific facets are inversely related, rather than proportionally or independently so, as proposed by the hierarchical and taxonomic models respectively. Accordingly, lower status on one specific facet of self-concept might be compensated by higher status on another specific facet of self-concept. For example, Winne and Marx (1981) found that students who were relatively less successful academically tended to perceive themselves as relatively more successful on the physical and social facets of self-concept. Conversely, they found that students who viewed themselves as relatively successful physically and socially were less successful on the academic facet of self-concept. The Winne and Marx data supported the hypothesis that a lack of self-perceived success and satisfaction in one area tends to be associated with one's perceptions of success and satisfaction in another area.

Purkey (1970) reviewed the theories on the development of the self-concept and identified the following common points of agreement:

1. The self-concept is organised and dynamic.
2. To the experiencing individual, the self-concept is the centre of his/her personal universe.
3. Everything is observed, interpreted and comprehended from a personal vantage point.
4. Human motivation is a product of the universal striving to maintain, protect and enhance the self-concept.

Self-concept is generally considered to be a multidimensional construct (Byrne, 1984; Harter, 1986; Marsh & Shavelson, 1985; Shavelson & Bolus, 1982). A considerable number of researchers studying the structure of self-concept have focused on the Shavelson et al

(1976) multifaceted, hierarchical model, e.g. Byrne, 1984; Marsh, 1986; Marsh, Barnes, Cairns & Tidman, 1984; Marsh, Barnes & Hovecar, 1985; Marsh, Craven & Debus, 1991). These researchers considered different domains of self-concept (e.g. academic, social, physical). Other researchers have considered specific areas within domains, such as reading and math self-concepts within the academic self-concept domain (Eccles, Wigfield, Harold and Blumenfeld, 1993; Marsh, 1990).

Research on Children's Self-concept

Research has documented some rather clear patterns in the development of self-concept in children. First, children demonstrate the capacity to identify different facets of self by five years of age (Marsh, Craven & Debus, 1991). Second, increasing differentiation is associated with age (Marsh et al. 1984). Third, young people's self-representations become increasingly abstract and less concrete with increasing age (Harter, 1983). Fourth, self-concept which is high in early and mid-childhood decreases in late childhood and adolescence before increasing again in late adolescence (Eccles, Wigfield, Flanagan, Miller, Reuman & Yee, 1989; Marsh, 1989).

The proposition that the self-concepts of children become increasingly differentiated with age and cognitive development has been carefully investigated in recent years. The multifaceted model of self-concept has been clearly described with children and adolescents (Harter, 1983). In an extensive research programmeme, Marsh has shown that children between five and 10 years of age can identify self-concepts of physical abilities, physical appearance, relations with peers, relations with parents, reading, mathematics, school subjects and a general self-concept (Marsh et al. 1984; 1991). He also found evidence for increasingly clear differentiation of each of those facets with age. Thus it appears that children, even at an early age, have rather sophisticated views of self. If facets become more differentiated with age, then it can be suggested that teachers, parents, peers and others play important roles in providing the information by which children come to see themselves more clearly.

In an extensive review of the literature, Harter (1983) concluded that children progress from self-description based on observable characteristics to trait descriptors and finally to self-representations based on psychological processes such as attitudes, emotions

and motives. Broadly, this seems to be congruent with the cognitive developmental model of Piaget. The use of concrete characteristics as descriptors, e.g. "I have blue eyes", is evidence of a less abstract form of thinking than is possible in the formal operations period when children can more easily understand the meaning of qualities such as friendly, shy and kind. Harter (1983; 1985; 1986) found that children's views about themselves change over childhood from a focus on concrete, observable aspects of the self, to psychological traits and finally to abstractions and psychological processes, in part because of their cognitive processing skills. Young children do not possess a concept of general self-worth and do not make a distinction between cognitive and physical skills. A child is either competent or incompetent across these activities. Harter (1985; 1986) reported that children's perceptions of competence correlated positively with one another and with their general self-worth, with the correlations between these constructs ranging between .40 to .67. During the elementary school years and adolescence, perceptions of physical appearance and social acceptance were found to relate most strongly to children's feeling of self-worth (Harter, 1987; 1988).

Marsh (1987) pointed out that young children frequently show evidence of unrealistically high self-concepts. They may claim levels of achievement and expectation which are unwarranted and it would be unfortunate if their self-concepts did not become more realistic on the basis of further experience. On the basis of his research, Marsh suggested that the egocentric nature of young children and their high, less clearly differentiated self-concepts, are relatively independent of external criteria. As they age, they incorporate more external information so that the self-concept becomes more closely aligned with external criteria.

Although the self-concept literature indicates general acceptance of the dimensionality of the self (Byrne, 1984), it is also held by some that during the kindergarten and early elementary school years children have relatively undifferentiated and positive self-concepts (Harter, 1986; Harter & Pike, 1984; Stipek, 1984). This view is based on the belief that young children are unable to make distinctions in academic performances which lead to differentiations in self-perceptions, because of the emphasis on individual mastery of developmentally appropriate skills, work habits, and social behaviour (Stipek & Mac Iver, 1989).

No other time is as critical as childhood for establishing positive self-concepts. Later academic success and life adjustments will be achieved only when children have feelings and perceptions of themselves as worthy individuals. The early years set the stage for a lifetime of positive or negative self-concepts that will influence every phase of daily life. Few aspects of development are as fundamental to children's effective daily functioning and general well-being as is their acquisition of a positive self-concept and the accompanying feelings of personal adequacy and self-worth (Heathington, 1980).

Fox (1988) suggested it is the child's perceived physical competence which is a more important predictor of overall self-concept than their actual ability. With respect to children, the relative importance of physical self-perceptions at different stages of childhood and adolescence has yet to be established and further exploration is necessary. Hebron (1966) found that elementary school children have higher self-images than secondary school children. If being good at games, play activities and sports is important to children, then success in these areas will have an impact on their self-concept. Gallahue (1989) supported the literature stating that perceived competence in a given situation and its perceived importance may have a significant impact on the actual competence and self-concept of the child. Thus, movement competence is an essential component part of self-concept development and plays a crucial role in positive self-esteem development.

Harter (1982) and Harter and Pike (1984) found that young children from four to seven years of age tend not to be able to differentiate between different categories of perceived competence in the gross motor and cognitive domains. These children tended to lump competence in the latter two domains together into a category of general competence, viewing social acceptance (by the peer group and mother) as important. Thus, prior to children entering the third school grade, they tend to view themselves as either competent or incompetent with little distinction between the physical, the motor and cognitive domains. Due to the very nature of self-concept development and the difficulty in quantification and measurement thereof, little research has been done that clearly reveals the unique contribution of human movement to the development of a positive self-concept in children (Gallahue, 1987). Accurate measurement of the extent of the influence is impossible due to the formidable number of variables influencing such research. Empirical findings are inconclusive. Martinek et al. (1977) and Schemp et al. (1983) reported a non-

significant relationship between motor skill performance and self-concept for elementary school children.

Self-concept and Behaviour

Butt and Pahnos (1995) stated that the emotional well-being of children is the direct result of a positive self-concept which is formed through positive social interaction with significant others such as parents, teachers and peers. Through interaction with such people, the role of significant others indicates that mothers who exhibited affectionate warmth toward their children had children with high self-concepts. Fathers who took an active and supportive role in child-rearing had children of high self-esteem. Thus, the prevalence of love given by important people in the life of a child builds a strong, positive self-image.

The composition of the self-concept determines the level of performance and achievement to which the person aspires (Horn & Hasbrook, 1987). The relationship between a child's school achievement and her self-concept has been the subject of much research. Most studies agree that academic success or failure appears to be deeply rooted in the concept of self . Studies by eminent psychologists and educational researchers indicate that by eight years of age - the end of the most intense period of play - a child's personality, character, creativity and academic motivation is 80% accomplished and that the subsequent years enlarge the content but do little to increase personal commitment or interest in learning. The most rapid growth in learning achievement and in certain personality traits occur during the age span encompassed by infancy, toddlerdom, the nursery school and the kindergarten - when children are apt to be playing, not studying. By the time a child goes to grade school, some of the most important things that ever happen to her are already behind her (Caplan & Caplan, 1973).

According to Ras (1981), poor scholastic achievement and negative self-concept are interrelated. A child with a negative self-concept is usually an underachiever and not able to utilise her learning potential. Results of educational research efforts on establishing the relationship between the physical and the cognitive domain in terms of self-concept as an intervening variable are inconsistent and inconclusive (Barlow, 1971; Cratty, 1967; Coopersmith, 1967; Fleming & Courtney, 1984). Seemingly investigators have attempted to demonstrate a cause-effect relationship between perceptual-motor training and academic

ability. An alternative exploration could be that a change in self-concept as a result of perceptual-motor training produces increased academic achievement, implying that the previously assumed direct relationship between perceptual-motor training and academic achievement does not explain fully the existing phenomena (Cobb, Chissom & Davis, 1975). A relevant issue of this investigation is to assess the influence of participation in an expressive movement programme on the self concept development of pre-schoolers.

Self-concept and Socio-ecomonic Status

Significant others in children's lives serve as models and mediators and play a crucial role in determining the results of learning (Gallahue, 1987). Coopersmith (1967) found that the work history of the father bears some relationship to the self-concept of the child. A child with a poor self-concept often has an unemployed father or a father whose job is unstable or requires frequent absences. No relationship was found between the mother's employment or non-employment and the self-concept of the child. It furthermore appears that social prestige does not have such a significant effect upon self-concept that is commonly associated with it (Rosenberg, 1965).

Survant (1972) characterised the typical kindergarten child with a positive self-concept as not being afraid of new situations, making friends easily, experimenting with new materials, trusting the teacher, being co-operative and able to follow reasonable rules, assuming responsibility for his/her behaviour, being creative and imaginative and talking freely. The assertiveness of self- accepting children can also be seen in their active involvement in the learning process. Because these children believe in their capacity to deal effectively with the challenges presented to them, they approach them with an enthusiasm and a self-assurance that is apparent in the level of energy they exhibit as in their task-orientated behaviours (Phillips & Zigler, 1980).

Page and Page (1992) elaborated further on children's behaviour commonly associated with a positive self-concept, including high levels of activity, curiosity about surroundings, a sense of humour, making friends easily, working and playing well with others, taking pride in work and carrying out plans and a willingness to take risks in learning activities. Furthermore, emotional well-being of children has been directly associated with a positive self-concept formed through positive social interaction with significant others and is

characterised by spontaneity, enthusiasm, joy, interest and happiness (Eliason & Jenkins, 1994; Butt & Pahnos, 1995).

The self-concept of the child determines his/her behaviour by providing a filtering system through which everything is perceived, evaluated and understood. The self-concept has a circular effect in that "it corroborates and supports the already existing beliefs about self and so tends to maintain and reinforce its own existence" (Combo, Avila & Purkey, 1971, p 44). This self-corroborating characteristic pertains to both positive and negative self-concept, making it difficult for self-concept to change once it has been established. Therefore, the development of a positive self-concept on the part of each child should be considered a priority in any programme for early childhood education (The National Society for the Study of Education, 1967).

Children with low self-concept reflect characteristics such as relying on others for direction, asking permission to do anything, seldom showing spontaneity or initiative, rarely entering new activities, isolating herself from others, rarely talking, being possessive of objects, making excessive demands, withdrawing or being aggressive (Survant, 1972). Children who do not feel good about themselves view the world with disappointment, anger, resentment, prejudice and fear (Eliason & Jenkins, 1994). Passivity, shyness, over-seriousness, grumbling, uncertainty, aggressiveness, gloominess and avoidance are emotive behaviours that are commonly exhibited in children with poor self-concept (Page & Page, 1992).

Bridgeman, Brent and Shipman (1978) found the self-concept of both middle- and low-socio-economic samples to be quite high in the pre-school years and through the first grade. By the third grade more variation in self-concept was noted and these third-grade scores were more strongly related to concurrent achievement measures. These results are consistent with suggestions from Kifer (1975) that differences in academic self-concept develop as a reaction to school success and failure rather than act as a cause of such school performance.

In comparison to elementary school children, both disadvantaged and advantaged high school students showed a diminishing of self-image, possibly due in part to the greater pressures of the higher level of education. It seems that the change from neighbourhood

schools to integrated high schools, with their greater competitiveness and less security, contributes to the lowering of self-image for both disadvantaged and advantaged youngsters (Soares & Soares, 1982). Besides identifying factors in the home situation such as parent-child relationships, birth order and sibling relationships; in the school such as peer relationships and teacher-pupil interaction; other salient determinants of a child's self-concept are factors of race, religion and socio-economic status (Elkind, 1971; 1989a).

Although there is literature that associates negative self-image with disadvantaged children, it is not generally supported with data. There has been research to indicate that disadvantaged children may have not only positive self-perceptions, but also self-perceptions higher than those reported by so-called "advantaged" children (Schweinhart, Weikart & Lerner, 1986; Soares & Soares 1971). Despite the equivocal evidence in the research, there is consensus that children from disadvantaged communities are at-risk for low self-concept development as a product of two persistent problems: the lack of successful role models with whom to identify, and the tendency to give up trying to achieve due to frustration aggravated by his/her socio-economic situation (Schweinhart & Weikart, 1986).

Some of the research indicating "positive self-perceptions" for disadvantaged children may be interpreted in terms of social learning. Many disadvantaged children associate with other disadvantaged children or modelling agents in their homes, schools and communities. The self-images which they have developed are reinforced by family members, friends and teachers (Werner, 1979). Relevant studies indicated that Mexican-American children have their own peer groups to which they can relate as well as other social support, so that they do not rate themselves according to "Anglo" society's perception of them and so do not have negative self-concepts.

Rosenberg (1965) found only a weak relationship of social class to self-esteem and no relationship of ethnic affiliation to self-esteem. Coopersmith (1967) concluded "It appears that the broader social context does not play as important a role in interpreting one's own successes as has often been assumed" (p. 35). He also discovered a weak relationship between social class and self-esteem. Wylie (1974) warned that much of the research on culturally disadvantaged children seem to mirror the negative attitudes of others and reflect the discrimination in their own negative self-images. Affected by poverty and

grossly under-stimulating conditions, they are too easily characterised as having low aspirations in academic areas, seeking immediate self-gratification rather than pursuing future goals and generally exhibiting a spirit of resignation (Dilorenzo 1968; Havighurst 1964). It is clear from research on disadvantaged children that possession of a negative self-concept is not to be presumed.

Movement and Self-concept

The self-concept is central to the life of the child to such an extent that motor experiences and impressions pertinent to the self are given content and meaning according to the self-evaluation. Problem-solving and role behaviour are based upon and limited by these concepts of the self. Insight is gained and reality testing is performed in terms of the image the child has of him or herself (Jacobs & Vrey, 1982).

Movement competence plays an important role in self-concept development, because children generally value being good in games, sports and play activities. Movement skill acquisition is an important avenue by which the self-concept may be enhanced as many of the daily life experiences of children are centred around the need for efficient and effective movement. Movement activities that are both developmentally appropriate and properly sequenced can contribute to self-concept enhancement of youngsters (Gallahue & Ozmun, 1995). Because of the potential for movement experiences to contribute to the development of the self-concept, this investigation includes an assessment of the influence of participation in an expressive movement programme on the self-concept of young children from a geo-physically deprived milieu.

Movement experiences are regarded as critical to early self-concept development (Ignico, 1994). Both boys and girls perceive competence in physical activities as extremely valuable which indicates a strong link between skill level and social status in children (Harter, 1982b; Weiss, 1987). The association of motor performance with self-identity during childhood is widely postulated (Chesson , McKay & Stephenson, 1991; Drowatzky 1981; Gallahue 1982; Zaichkowsky & Martinek, 1980) According to Zaichkowsky et al. (1980):

> The ability of a child to function well physically has important implications for manifestations of self-image. This is especially true with physical characteristics

such as size and strength than with other aspects of the body (p. 167).

Gallahue (1982) stated that children who move successfully experience positive reinforcement of their self-image whereas those with movement difficulties "... encounter repeated failure in their everyday play experiences. As a result, they often encounter difficulties in establishing a stable view of themselves as worthy beings" (p. 329). If the outcomes of movement experiences do not match children's expectations, feelings of inadequacy may result, leading to poor performances, thus reinforcing a poor self-concept (Weiller, 1992). Hebron stated that youngsters make up to 70% of their decisions by the age of eight to participate in activity based on their level of competence. Thus, even though a feeling of worth and belonging is necessary for positive emotional development, skill development for competence must be emphasised through a broad based movement programme (in Pangrazi, 1982). Furthermore, a child who is positively orientated and has a sense of belonging, worth and competence possesses a strong foundation for learning.

Given the potential relationship between motor ability and self-image, Drowatzky (1981) submitted the nature of the relationship may vary according to age and level of physical maturity. He suggested that the relationship is most potent during childhood when great emphasis is placed on physical characteristics and abilities, but that it reduces through to adulthood as alternative ways of gaining recognition and enhancing self-esteem are realised.

Self-concept and Children with Movement Difficulties

Research has indicated that there are social and affective concomitants associated with motor difficulties experienced by children (Miyahara, 1994; Schoemaker & Kalverboer, 1994). Most of these studies have focused on isolated aspects of social and affective functioning, such as self-concept (Henderson et al. 1989; Kalliopuska & Karila, 1987; O'Dwyer, 1987; Shaw, Levine & Belfer, 1982; Van Rossum & Vermeer, 1990), attributional style (Henderson et al. 1989) or personality characteristics (Kalverboer, De Vries & Van Dellen, 1990), and the majority have involved children over eight years of age (Harter, 1983; Marsh et al. 1991).

The impact of movement difficulties on social and emotional development depends to a large extent on the value that both the child and his or her social milieu place on proficiency in physical activities. In many societies, skilfulness in sport and games is highly valued. Duda (1987) found that most American children preferred to succeed in sport rather than in classroom activities. Weingarten (1980) found that skilfulness in sport and games was one of the best predictors of social status and Wiegersma (1980) demonstrated that motor proficiency played a particular role in the development of self-concept at school age. From these finding the assumptions could be made that children who are less proficient in motor skills may be expected to develop a lower physical self-concept.

This expectation has been confirmed in several studies (Henderson et al. 1989; Kalliopuska & Karila, 1987; O'Dwyer, 1987; Schoemaker & Kalverboer, 1994; Shaw et al. 1982; Van Rossum & Vermeer, 1990). It has been found that children age five and over assess their own competence by comparing their performances with the performances of their peers (Horn & Hasbrook, 1987). According to both Nichols's (1990) developmental theory of achievement motivation and Harter's (1987) theory of competence motivation, a major goal of achievement behaviour is the feeling that one is "competent". This self-perception of competence in turn is a critical mediator of performance and persistence. Because of their movement problems, children who are clumsy are exposed to experiences that seem likely to detract from feelings of competence. For example, they may be repeatedly confronted by failure in movement situations (Cratty, 1979). Their peers may criticise them or even make fun of them. Parents and teachers may react negatively because they suspect the child of not trying hard enough to perform well. The negative reactions of peers and significant others may lead to lower perceived competence toward social relationships. In a study by Shaw et al. (1982), children who were clumsy rated themselves as less acceptable in social relationships than children whose movement control was "normal", although this finding was not confirmed in a subsequent study by Van Rossum and Vermeer (1990).

According to Harter (1978), most people attempt to behave in a manner that minimises revealing areas in which they lack competence. It has been suggested that the failure experienced by children with movement difficulties, their loss of self-esteem and the negative reactions of peers may result in their withdrawal from social situations in order to prevent additional failure. Support for this hypothesis has come from several studies.

Children with movement difficulties were found to be more introverted than children without movement problems (Kalverboer et al. 1990).

Aggressive, disruptive and clownish behaviours by children who have movement difficulties have been reported (Kalverboer et al. 1990; Wall, Reid & Paton, 1990). Withdrawal from social situations as a consequence of both lack of skilfulness and peer criticism may create a vicious circle; children who experience movement difficulties avoid motor activities for fear of failure and thus having fewer opportunities to practice skills. This in turn may accentuate their movement problems (Johnston, Short & Crawford, 1987; Wall et al. 1990) and contribute to their poor self-concept.

Much of the research on self-concept and motor skill performance has dealt with children with movement skills problems who were eight years old and older. These children have had a number of years of formal schooling, with all the pressures and complexities that are associated with classroom and playground activities. Shoemaker and Kalverboer (1994) were interested to see if children with developmental coordination disorder had various social and affective difficulties earlier in life. In addition, they wanted to look at the relationship between the severity of developmental coordination disorder and the child's social and affective problems. They found that even by the age of six or seven years, children with developmental coordination disorder had fewer play-mates and were asked to play less often that their peers.The consequences of their physical limitations were already being experienced, and this had a detrimental effect on their self-esteem. Both parents and teachers of the children with developmental coordination disorder judged them to be more introverted, more serious, more insecure, more isolated and less happy than their matched controls. The children also reported that they were aware of their difficulties. With regards to the relationship between the severity of developmental coordination disorder and the child's associated difficulties, Shoemaker and Kalverboer found that all of the children had one or more social or affective problems regardless of the degree of developmental coordination disorder.

Chesson et al. (1991) reported that children with motor learning difficulties persistently performed poorly at games and were reluctant to participate in sport activities. They were often socially isolated and this lack of acceptance by their peers was identified as a negative influence on their self-esteem. Dickstein (1977) agreed that children who felt

inadequate to perform every day functional movement tasks were vulnerable to the development of a negative self-concept. This negative view of the self was often manifested in a fear to try new things as well as self-statements of incompetence, clumsiness and poor social comparison. Additional research has further established the tie between movement competence and self-concept. Children experiencing difficulties with visual-spatial abilities, for example, had problems developing positive self-concepts (Doyle & Higginson, 1984). The presence of these difficulties, in addition to the movement difficulties, is notable because they have possible implications for the child's future. The lowering of self-esteem and a sense of low self-efficacy in childhood has been linked to later psychiatric disorder. Feelings of inferiority, anxiety and introversion have been mentioned as precursors to later problems with social relationships and depression (Schoemaker & Kalverboer, 1994).

The Assessment of Self-concept

Self-concept research before the 1980's was criticised for methodological shortcomings and psychometrically inadequate measurement instruments (Marsh, 1987; Vispoel, 1995). Through the mid-1970's self-concept instruments typically consisted of a collection of self-referent items, and so exploratory factor analyses failed to identify salient, replicable facets of self-concept (Marsh, Relich & Smith, 1983). More recently, researchers have developed self-concept instruments to measure specific facets that are based on an explicit theoretical model, and then used factor analysis to support these prior facets (Dusek & Flaherty, 1981; Fleming & Courtney, 1984; Harter, 1982a; Marsh et al., 1984; Marsh et al., 1985, Marsh & O'Niel, 1984; Soares & Soares, 1982).

The problems that surround self-concept assessment in children are many. Zaichkowsky et al. (1980) indicated that attitudes toward the self do not become generalised until about eight years of age. Prior to age eight they appear to be more a function of perceptions of efficacy in immediate situations. This developmental consideration, combined with the additional problems of reading comprehension and reactions to testing environments, has complicated the process of assessment of self-concept prior to age eight.

The two most widely employed instruments with children are the Coopersmith Self-Esteem Inventory (Coopersmith, 1959; 1967) and the Piers-Harris Children's Self-Concept

Scale (Piers & Harris, 1969). On both of these self-report instruments, a total score is calculated across items tapping diverse content, and this total score is considered to reflect the child's global self-esteem.

Some researchers have found Coopersmith's instrument to be disappointing because the original item pool was drawn from an adult scale (Rogers & Dymond, 1954), and items were reworded for children. Coopersmith (1959) initially identified four potential domains across which self-evaluations might differ, namely, school, peers, parents and general references to the self. However, on the basis of an unspecified analysis of the responses of 56 children 10 - 12 year of age, he concluded that children of this age do not differentiate among these dimensions, therefore justifying calculation of a total score. This score is interpreted as an index of the child's global feeling of self-esteem, which could then be generalised to any domain. Subsequent factor-analytic studies (Kokenes, 1974), demonstrated that this conclusion is simply unwarranted, as do the findings with other instruments that demonstrated that children made clear distinctions between domains that have been meaningfully derived, for example, the Piers and Harris Self-Concept Scale, and the Perceived Competence Scale for Children (Harter, 1982a). Wylie (1974) raised a number of other concerns and concluded that the Coopersmith instrument was not appropriate for self-concept research on children and at best, the scale would seem to be tapping the child's idealised self across a variety of diverse content areas.

The 80 items in the Piers-Harris self-concept scale were adapted from a pool of statements collected by Jersild (1952) who asked children to comment on features about themselves which they liked and did not like. For Piers and Harris, self-concept refers to "a set of relatively stable self-attitudes" which are "not only descriptive but also evaluative (Piers & Harris, 1969). Unlike Coopersmith, Piers and Harris seem to have begun their endeavour to construct a scale under the assumption that the self-concept was relatively uni-dimensional. However, their initial factor analysis of the scale, with a sample of sixth graders, revealed the existence of six interpretable factors: behaviour, intellectual status, physical appearance and attributes, anxiety, popularity and happiness/satisfaction. The Piers-Harris instrument is more popular with researchers than the Coopersmith inventory, although there has been some question about its reliability for children who achieve low scores (Wylie, 1974).

Harter (1982b; 1985; 1986) together with other researchers such as Marsh (1986; 1989; 1990), Marsh and Shavelson (1985), and Shavelson and Bolus (1982) studied specific aspects of the self-concept and focused on perceived competence as a critical dimension of the self -concept. Harter's (1982a) original Perceived Competence Scale included three dimensions of competence: cognitive, social and physical. Harter chose these domains because she believed they were central to school-aged children's sense of self. Harter (1985; 1988) revised the original scale (now called the Self-Perceptions Profile) to include the additional dimensions of physical appearance and behavioural conduct. The Perceived Competence Scale for children is sensitive to domain-specific perceptions of competence, yet allows for the determination of global self-concept over and above the child's perception of competence.

Although the Perceived Competence Scale is not a developmentally based instrument, a pictorial version for younger children, aged four to seven, has been devised (Harter, 1981; Harter & Pike, 1984). The sub-scales included were cognitive competence, physical and social competence. General self-worth was not included based on their assumption supported by pilot data, that young children do not have a sense of self in general and so they can only evaluate specific behaviours. Factor analyses revealed that a two-factor solution best describes this scale: firstly, general competence as defined by the cognitive and physical sub-scales and secondly, social acceptance as revealed by the peer acceptance sub-scales.

For the purpose of the current investigation, the Pre-school and Primary Self-Concept Scale (PPSC) (Stager & Young, 1982) using pictorial stimuli and response and verbal directions in a semantic differential format, was selected as a measuring instrument of self-concept of the pre-school children. The PPSC meets the need for a self-concept test for children who cannot read and or whose oral expressive skills are limited and permits the assessment of both global self-concept ("Me") and role-specific self-concepts ("Me in school", "Me at home"). The PPSC consists of seven rating scales in the semantic differential format, taking into consideration the short attention span of young children. The self-report, semantic differential format was considered consistent with the author's definition of self-concept as the child's thoughts and feelings having reference to himself or herself as an object. The assumptions that guided the construction of this scale were: firstly, that the child is the most appropriate person to provide information about the self-

concept; and secondly, that the semantic differential scales represent the theoretically heterogeneous concept of self-concept and thirdly that the scales are continuous variables. The semantic differential format is furthermore appropriate as it permits examination of three dimensions of self-concept, namely, the direction, whether the child views the self favourably or unfavourably; the intensity, how strongly favourable or unfavourable the child's feelings about the self are and the content, what dispositions the child views the self as having (Rosenberg, 1979).

Summary of Self-concept

The self-concept contributes to a child's sense of belonging, sense of worth, sense of competence and sense of achievement. The self-concept contributes to the what's and how's of making friends, experimenting and exploring in new or novel situations, trusting people, assuming responsibility for actions and behaviours, being creative and imaginative and showing initiative (Yawkey 1980). Furthermore, the self-concept is a product of the ongoing exchange between a child and his social and physical surroundings. Far from being a passive recipient of the messages about the self the child receives at home and at school, she actively responds to the challenges and feedback impinging upon and subsequently shaping her views of herself (Phillips & Zigler, 1980).

Although there are competing approaches to understanding the factors and dynamic relationships among the factors that comprise self-concept, there is agreement that the self-concept is not predetermined or innate but malleable and modifiable indicates why it is so important to young children and to adults working with them in home and school setting (Yawkey, 1980). How children are treated by the significant people in their formative years determines to a great extent the self-esteem they will have as adults. For example, if the child has developed trust, autonomy and initiative, a healthy self-concept is much in evidence by the age of five (Survant, 1972).

The concept of the self has been addressed from many theoretical frameworks, leading to the coining of various related concepts such as self-concept and self-esteem used both separately and interchangeably, causing some confusion as to the discrete place of each in the tapestry of the study of the self. There is consensus, however, that a child's respect for, acceptance of and belief in him or herself does not just happen. A positive self-concept

is proposed to be the result of experiences in environments that offer opportunities to explore and share and to test ideas, skills and feelings with the positive support of significant others (Roderick, 1980). The most important element in a child's eventual appreciation of her existence is the harmony of thought and action that results from promoting strengths rather than deficits (Mangold, 1980).

Although younger children often view themselves as situated at one end of two extremes - good or bad, rather than being able to make situation-specific perceptions of the self (Gallahue, 1987), self-concept appears to be a learned concept for all children. It is affected profoundly by other people's perceptions of them and the extent to which children are encouraged to feel good about the themselves by significant others (Doyle & Higginson, 1984). Between the ages two and seven years, children are forming their self-concepts, learning to discriminate between themselves and others, becoming aware of themselves as members of a group and learning the social and cultural meaning of such group membership, and starting to apply evaluative labels to themselves and their behaviour (Clark, 1965; Clement et al. 1984).

Despite problematic measurement procedures associated with research, it is relatively easy in practical settings to observe positive changes in children who have been involved in movement education programmes that are success-orientated, developmentally appropriate, orientated toward reasonable goals, challenging, individualised in instruction and full of positive reinforcement (Gallahue, 1987). Because participation in an expressive movement programme could have an influence on the development of self-concept, a measurement instrument was selected for administration in this study that has been used previously with very young children. This instrument is the Primary and Pre-school Scale which has been used in educational settings with young children (Stager & Young, 1982). Because it is a pictorial-based scale, with sets of simple bi-polar adjectives, it was considered appropriate for children who have limited vocabularies and who may not have English as their first language, i.e. the adjectives could be easily translated into any language.

Movement Programmes as Intervention Strategies

The importance of providing young children with movement education programmes is partially rooted in the benefits anticipated for children with movement difficulties. Longitudinal studies have shown that without treatment motor difficulties seen in early years can still be found in teenage years and carries an increasing risk of other learning difficulties at school age (Cantell et al. 1994; Geuze & Börger, 1993; Lyytinen & Ahonen, 1989). Schoemaker et al. (1994) found that if children with developmental coordination disorder were treated with a physiotherapy programme the long-term beneficial effects were evident in not only the motor domain but also the social and affective domains. Wright and Sugden (1996b) reported that teachers found a concomitant improvement in associated behaviours, with improved motor function through a school based intervention programme.

Literature on physical activity programmes for pre-schoolers in general suggests that participation in health-related fitness and motor development programmes are appropriate means of enhancing children's total development. It has been maintained that intervention during this phase of child development is crucial in developing a foundation that may have a significant influence on the quality of life and intellectual productivity in a child's later years (Gabbard, 1988). Kephart (1960) proposed that the basic readiness skills essential for the optimal learning of high-level cognitive skills are essentially perceptual-motor skills. He concluded that adequate early sensory-motor experiences result in an organisation of the central nervous system which is necessary for adequate perceptual functioning which is, in turn, essential for adequate cognitive functioning. Intellectual functioning is seen to follow a course of hierarchical development wherein high-level cognitive achievement is dependant upon earlier sensory-motor achievement and experience (Piaget, 1952).

Perceptual-motor Intervention Programmes

The most often cited theorists in the area of perceptual-motor development programmes include Barsch, Frostig, Kephart, Getman and Delacato. Despite differences in each theorists approach to defining content and methods, the following characteristics appear to be common to all perceptual-motor programmes:

⇒ The use of gross motor activities as the primary means of involvement

⇒ The use of structured activities organised in planned sequences

⇒ Training to improve basic sensory skills (visual, auditory, and tactile) as well as motor skills

⇒ The emphasis that is placed on role of perceptual-motor programmes in the facilitation of academic learning.

Differences among the various perceptual-motor programmes appear to stem from:

⇒ Differences among the theoretical models that explain movement development and control, and that serve to guide programme content and methods, for example, the differences in the approaches Kephart (1960), Delacato (1963), and Barsch (1965a).

⇒ Differences in the areas of children's development targeted for remediation

⇒ Differences in the specific benefits attributed to participation in each of the specific programmemes.

The following sections briefly outline four approaches that will illustrate the impact of differences in movement theory, objectives, and outcomes on the contents and methods of perceptual-motor development programmemes. The programmes of Kephart, Doman and Delacato, Getman and Kane, and Barsch will be reviewed, specifically.

The Slow Learner Programme of Kephart (1960)

The basic premise of the Slow Learner Programme was that sensory-motor skills are the foundation on which all learning exists. Kephart (1960) placed considerable emphasis on early motor learning and on the development of fundamental movement patterns, rather than on specific skills. The premature development of "splinter skills" must be avoided. A "splinter skill" develops when training remains specific and the child's attention is directed towards performance rather than the goal of the movement. Motor movement patterns must become generalised in order to establish directionality, laterality and perceptual-motor match skills (Roach & Kephart, 1966).

> The essence of the perceptual-motor theory is a sequence of learning stages through which the child progresses. Later complex learning are built upon initial learning in a hierarchical fashion (Roach & Kephart, 1966, p. 3).

Emphasis is placed on generalisation (Kephart, 1967). Success in learning or remediation of such academic activities as reading, writing, or spelling occurs when they are broken down into basic perceptual-motor skills and teaching is directed toward them. Rather than using traditional methods to teach a child who is having difficulty with reading, Kephart suggested procedures based on remediating the basic skills involved in the reading process. Among the various basic skills that Kephart emphasised were laterality, directionality, ability to stop eye movements and dexterity. Furthermore, Kephart (1971) specifically mentioned the following perceptual-motor aspects to be enhanced through his programme because he considered them to be the foundations of perceptual-motor functioning:

- Gross motor skills
- Eye-hand coordination
- Temporal-spatial translations
- Posture
- Laterality
- Directionality
- Body image
- Perceptual processing
- Agility (which he termed flexibility).

The Neurologic Organisation Programme of Doman and Delacato (1963)

Working with children diagnosed as brain-injured, Doman and Delacato (1963) based their programme upon the theoretic principle of neurologic organisation which follows the premise that ontogeny recapitulates phylogeny. This means that human development repeats the pattern of man's evolutionary development. Children having difficulty with mobility, communication and or learning are believed to have "missed a step" in a sequential continuum of neurological development. The following assumptions supported their approach:

1. A child's central nervous system (brain, spinal cord, and nerve pathways) develops in a definite pattern from conception to about the age of eight.

2. Progression of this development can be measured on a scale of neurologic organisation in the following areas:

   - Movement of body (from birth movements of arms and legs up to skilled walking)
   - Speech (from crying at birth up to a complete vocabulary and proper sentence structure)
   - Manual skills (from grasp reflex to writing with dominant hand)
   - Visual skills (from light reflex at birth to reading)
   - Tactile skills (from birth reflexes to identification of objects by touch).

3. The speed at which this development takes place varies widely among individual children.

4. Neurologic growth can be slowed down slightly by some methods of rearing children. It can be slowed down considerably by depriving a child of necessary stimulation in his environment. It can be stopped completely by brain damage.

5. An immature child or a slow learner is the result of delay in neurologic development. A youngster with reading problems in school despite good instruction suffers from a disorganisation of neurologic growth.

6. In terms of neurologic development, all children can be included in a range that stretches from the severely brain-damaged child in a coma just one breath away from death to the youngster who is very superior mentally and physically.

7. By stimulating the development of the central nervous system, it is possible to push children considerably up the ladder of neurologic development - in other words, to help brain-injured children perform at normal and sometimes better-than-normal levels.

8. Not only can a child's neurologic development be slowed down by injury to the brain or by deprivations in the environment, it can also be speeded up by simple, non-surgical methods.

9. By the same methods, the neurologic development of normal children can be stimulated - in other words, their mental abilities can be increased.

The implementation of the Doman-Delacato programme is somewhat controversial since it involves treatment at the level of neurologic development linked with various perceptual-motor activities at which the child has experienced failure. This means, for example, that a child with a particular learning difficulty, might be required to "go back to the crawling stage" and work on his/her crawling until proficiency is achieved. The assumption would be that the child had "missed" some aspect of neurological development inherent in the crawling stage, and that repeating this stage, the deficit would be addressed. Delacato (in Myers & Hammill, 1969) defined this as "treating a central problem where it exists, in the central nervous system, not in the peripheral areas" (p.227). This programme is not only controversial, but it also requires personnel with specific training and understanding of the complete remedial procedures.

The Visuo-motor Model of Getman and Kane (1964)

Getman and Kane (1964) advanced the theory that a child's growth, intellectual achievement and behaviour were directly related to a basic sequence of visual development. Statements by Getman reflected this strong emphasis on the visual process: "80% of everything we learn is learned visually" and "vision is intelligence" (Getman, 1962, p. 20). Getman's original programme was based on the sequence and development associated with the first five years of life. He has organised this sequence into six interrelated stages:

- General motor patterns - the child learns when he/she moves
- Special movement patterns - synchronised use of body parts, such as eye-hand coordination
- Eye movement patterns - efficient visual patterns free the hands for more economic use
- Visual language patterns - effective communication patterns assist in verifying visual discriminations

- Visualisation patterns - visual memory skills that substitute for action, speech, and/or time

- Visual perceptual organisations - ability to interchange sensory stimuli memories with the original stimuli and to interrelate it with the environment.

The following basic premises of the Getman training programme were found in his revised text co-authored by Kane in 1964:

1. Academic performance in today's schools depends heavily upon form and symbol recognition and interpretation.

2. There are perceptual skills which can be developed through training.

3. The development of perceptual skills is related to the levels of coordination of the body system, that is, the better the prospects are for developing perception of forms and symbols.

4. The child whose perceptual skills have been developed and extended is the one who is free to profit from instruction and to learn independently.

It could be concluded that the strong emphasis on vision in the Getman and Kane model is a narrow approach, however, it could be applicable to improving the visual efficiency of children exhibiting visual learning problems not attributed to physiologic defects of the eye.

The Movigenic Theory of Barsch (1967)

The movigenic theory developed by Barsch (1967) was based upon the belief that movement patterns are the key to learning efficiency. Barsch believed that movement is a variable in all learning and that all children need to learn to move well. Barsch (1967) viewed the child as a "terranaut" moving within a self-perceived space world. He implemented his programme in a curriculum for children with learning problems that was based on 12 dimensions of perceptual-motor development (Barsch, 1965a):

Postural-transport Orientation

- Muscular strength

- Dynamic balance

- Spatial awareness
- Body awareness

Percepto-Cognitive Modes (the four primary functional channels of reception and expression)

- Visual dynamics
- Auditory dynamics
- Kinesthesia
- Tactile dynamics

Degrees of Freedom (those factors which enlarge, enrich, expand, and explicate the performance efficiency of all others)

- Bilaterality
- Rhythm
- Flexibility
- Motor planning

Barsch's (1967) theory was based upon the following principles:

1. The fundamental principle underlying the design of the human organism is movement efficiency.

2. The primary objective of movement efficiency is to economically promote the survival of the organism. An individual survives in this world by moving.

3. Movement efficiency is derived from the information the organism is able to process from an energy environment.

4. The human mechanism for transforming energy forms into information is the perceptual-cognitive system. The sensory systems for obtaining data are sight, hearing, touch, feeling, smell and taste. These organs serve as agents for processing information for the brain.

5. The terrain of movement is space. Individuals must learn to move in both physical and cognitive space in order to move most efficiently.

6. Developmental momentum provides a constant forward thrust towards maturity and demands an equilibrium to maintain direction.

7. Movement efficiency is developed in a climate of stress. Stress is viewed as a part of life. Some stress is considered necessary for learning, while other types of stress negatively affect the individual's efficiency.

8. The adequacy of the feedback system is critical to the development of movement efficiency. An individual's feedback system actually helps him or her to learn more efficiently. Inadequate feedback may result in some type of disorder.

9. Development of movement efficiency occurs in segments of sequential expansion. Movement efficiency develops from single to more complex movement. The rate of learning certain behaviours similarly varies throughout life.

10. Movement efficiency is symbolically communicated through the visual-spatial phenomenon called language. Movement efficiency is a very important factor in language development.

"Movigenics" could be regarded as the perceptual-motor development programme that is closest in content and method to that of movement education, an approach to physical education that is based on principles of integrated motor development.

Research on Perceptual-motor Programmes

Unfortunately, much of the "evidence" provided to suupport the effectiveness of any of the perceptual-motor development programmes has been anecdotal in nature. There have been some studies completed, however, that are more scientific in nature. Painter (1966) investigated the effect of a rhythmic and sensory motor activity programme on perceptual motor spatial abilities of kindergarten children. Training sessions were given to the experimental group, extending over a period of seven weeks at a frequency of three times a week for an half an hour duration each. The programme of rhythmic and sensory motor experiences brought about significant gains in specific learning and skills, viz.,body image,

perceptual motor integration and psycholinguistic competence. The positive results suggest further investigation and illustrate the need for specific developmental programmes.

Schaney, Brekke, Landry & Burke (1976) investigated the effect of a perceptual-motor training programme on the reading achievement of first-grade children. The programme was presented for one hour a day, two days a week for a period of nine weeks. The experimental group of children who were reading, initially, below grade level and who received perceptual-motor training showed significant gains in reading achievement over the control group. The evidence can be interpreted as lending support to the principle that some form of patterned perceptual-motor activities facilitate the development of cognitive skills, at the very least, reading achievement.

Super (1979) demonstrated in his research on the effectiveness of the Transvaal Education Department's school readiness programme of eight to 10 week duration that there was positive development of perceptual skills at the completion of the programme. The most perceptual development on average takes place in learning skills such as counting, writing, copying equally space beats and in hand control on visuo-motor tasks. The least perceptual development takes place in tasks which appear to rely heavily on maturation such as in word recall, number recall, directionality and ball throwing. Super (1979) furthermore found the most development to take place in the area of visual motor perception, auditory motor perception, fine motor perception, body image and gross motor perception.

Schaney et al. (1976) measured the immediate and long-term effects of perceptual-motor training on kindergarten children by the Gesell Copy Forms Test. A significant increase from the pre-test to the first post-test (five months interval) was made by the experimental group but none by the control group. The second post-test (10 months interval) showed that these gains were relatively long-term rather than short-term. The experimental group was involved in a Developing Learning Readiness programme for 45 minutes per day over a 10-week period, one day per week. During this time the control group participated in a regular kindergarten classroom. The experimental group was in the same regular kindergarten classroom but also took part in the supplemental visual, motor and tactile skills programme which facilitated the development of general coordination, balance, eye-hand coordination, eye movement, form recognition and visual memory.

The effect of a perceptual-motor training programme on the self-concept of pre-school children with deficits in gross motor skills and self-concept was investigated by Platzer (1976). At the conclusion of a 10-week programme (30 minutes daily), children who had participated in the programme demonstrated a more positive self-concept as measured by the Goodenough projective test, than children who had not participated.

Herkowitz (1977) found that a child may be so encouraged by a perceptual-motor training programme that her self-concept may be positively affected and the resultant increased motivation may positively contribute to the enhancement of her abilities. She contended that planned movement experiences:

⇒ Foster the development of feelings of security, self-confidence and self-worth

⇒ Encourage risk taking behaviour, which prepares children to seek a wider variety of learning opportunities later in life

⇒ Foster the formation of an accurate self-concept.

If we believe in the worth and importance of the development of motor skills, in the growth and development of young children, it would appear that perceptual-motor programmes would be of great significance in the life of the child even if they did not lead to an improvement in reading or other cognitive areas (Lerch et al.,1980).

> Movement programmes have many benefits. They exercise the whole body (including the mind) and not just the muscles, they create a love of movement that develops into a lifetime desire for physical fitness, and the success-orientated philosophy provides numerous opportunities for learning, participating and enjoying (Pica 1992, p.3).

Flinchum (1988) supported this finding and stated that:

> Movement activities can enhance cognitive potential, perception, memory retrieval and language arts. Furthermore, the child's self-concept may be improved through mastery of self-act goals...basic to a positive self-concept (p. 62).

Summary of Perceptual-Motor Programmes

Perceptual-motor programmes are defined as means of teaching children the use of the body mechanisms which serve to monitor and control body positions and movements and enable them to derive meaning from sensory experiences (Fleming & Courtney, 1984). Theorists have suggested that early intervention through gross motor development programmes are appropriate means to address perceptual-motor weaknesses and to enhance the academic development of the young child.

Several researchers contend that early intervention during the fundamental motor skills phase is crucial in developing a foundation that may have a significant influence on the quality of life and intellectual productivity in a child's later years (Gabbard, Le Blanc & Lowy, 1987; Gabbard, 1988; Gallahue, 1989). Unfortunately, most perceptual-motor development programmes have been considered by educators as remedial training programmes which exclude the normal child from a sound developmental perceptual-motor programme such as the kind proposed by Cratty (1970).

Movement experiences have been identified as crucial to the facilitation of cognitive development. Zaichkowsky et al. (1980) believed that perceptual-motor experiences make indirect contributions to academic success. By indirect contributions they mean that perceptual-motor experiences may contribute to increased perceptual abilities, motor skills, self confidence and attention, all of which may ultimately affect academic achievement. Research efforts have attempted to document the virtues of perceptual-motor activity programmes on the readiness and remedial aspects of perceptual and cognitive development on the child. The available results are inconclusive, but there is ample evidence to suggest that perceptual-motor activity programmes are making a limited but positive contribution to the motor and perceptual development of children (Kavale & Mattson, 1983).

Movement Educational Models

All human behaviour is interlinked. Though Bloom (1956) separated human behaviour into the cognitive, the affective and the psychomotor domains, educators accept the holistic nature of human learning and behaviour. Therefore, improving behaviours in

any one domain is likely to facilitate behaviour in all others. This has been illustrated in studies where improving the quality of movement behaviour has been shown to have positive effects on intellectual function and self-esteem in children (Payne, 1990). The acceptance of integrated functioning means that the study of motor development should be viewed from the perspective of the totality of humankind and that intervention programmes could be conceived from an broader educational perspective rather than a strictly perceptual-motor perspective (Gallahue, 1989).

Physical education has been the curriculum area within the school that has included perceptual-motor development as one of its objectives. There is evidence that school physical education programmes for young children can have a significant positive effect on children's fundamental motor skill performances. Pre-school children who received a 10-week motor skill instructional programme showed significant improvement in fundamental motor skills as measured by the Test of Gross Motor Development (Ignico 1991a, 1991b). Unfortunately, some of the suggestions for the content of early movement development programmes have been scaled-down versions of curricula designed for older children. The more traditional activities-centered approach focuses primarily on the selection of simple games and dances as the core of the curriculum. An alternative to this general model has been a model based on motor development, referred to in the literature as movement education (Gabbard et al. 1987; Gallahue, 1989).

Movement educators have proposed various models to guide curriculum development as well as the choice of teaching style. However, all of these models reflect a commitment to a motor development perspective, which includes the identification of specific perceptual-motor components that must be included in early childhood programmemes. The essential content elements proposed by Gabbard (1988) are representative of the models put forth to define the content framework for early childhood movement education (see Table 1).

Table 1. Essential elements of an early childhood movement education curriculum

Essential Elements			
Movement Awareness	Fundamental Locomotor Skills	Fundamental Non-Locomotor Skills	Fundamental Manipulative skills
Components	Components	Components	Components
Body awareness Spatial Awareness Directional awareness Temporal awareness Rhythm Eye-hand coordination Foot-eye coordination Vestibular perception Visusal perception Auditory perception Tactile perception	Walking Running Leaping Jumping/landing Hopping Galloping Sliding Skipping Body rolling Climbing	Dodging Stretching/bending Turning/twisting Pushing/pulling Swinging/swaying	*Propulsion:* Rolling Throwing Bouncing Striking Kicking *Reception:* Catching Trapping

Grineski (1992) agreed with Gabbard's (1988) inclusion of movement awareness concepts as developmentally appropriate movement content for pre-schoolers. Movement awareness was considered to be the foundation for the learning of basic motor skill and specialised skill development, thus supporting the view that there is a hierarchy of components within the process of motor skill development. Along with a diverse and efficient movement awareness base, the acquisition of fundamental skills form the movement foundation upon which more complex games, dance, and gymnastic activities can be performed. The three categories of fundamental movement are:

1. Locomotor skills - movements that propel the individual through space (e.g. run, jump, skip).
2. Non-locomotor skills - movements are executed with minimal or no movement of one's base of support, sometimes described as skills of stability (e.g. twist/turn, swing/sway).
3. Manipulative skills (propulsion and reception) - movements that focus upon the control of objects primarily with use of the hands and feet (Gallahue, 1993).

A common characteristic among the developmental models for early childhood movement education is the premise that there are phases that characterize the developmental motor skill capabilities. Gabbard et al. (1987) identified the early childhood

state (approximately two to seven years of age) as the phase of fundamental movement skill development.

Critical Periods

Curriculum models for early childhood movement education attend to the concept of "critical periods" in motor development. The concept of a critical period of motor development refers to a time span during which the acquisition of specific movement skills and abilities can irreversibly alter later motor functioning. Arnheim and Pestolesi (1973) stated that the critical period for children's gross motor development was between four and seven years of age. According to Bee (1989) all fundamental motor skills should have been developed by the age of six or seven. Gallahue and Ozmun (1995) supported the notion that children have the developmental potential to be at the mature stage of most fundamental movement skills by approximately age six.

There is some evidence there is also a critical age period during which the negative effects of deprivation of movement experiences may be maximised. Jackson (1958) identified this time period between nine months and five years old. Levine (1962) suggested that the critical period for developing the capacity for environmental interpretation, symbolism and language is between the ages of two and four years. He recommended educational facilities for lower socio-economic class children who might otherwise be deprived of adequate stimulation from their surroundings during these critical years. As early as 1968, Tennant (1968) recommeneded further investigation into the effect of environmental deprivation on visual-motor perceptual abilities with the view toward developing enrichment courses for South African children from disadvantaged backgrounds.

Although the concept of critical periods does not imply that children cannot learn during other developmental periods of their lives, it is widely accepted that children exhibit a definite age-related improvement in their ability to process information requisite to the production of a movement (Gallahue & Ozmun, 1995). The explanation for this change includes both maturational linked factors and learning factors related to retrification of processing deficits. Additionally children demonstrate changes in the processing strategies which they utilize to act on incoming information. These changes make the child more receptive to increasingly complex tasks and task information, and as a result provide a

direction for progressions of movement experiences within a movement education programme.

Understanding the motor development of young children forms the basis for quality structured movement experiences. Movement activities must be broken down to their simplest developmental level to accommodate the young child (Stinson, 1990). Maturation and experience levels are factors influencing the learning of new and more complex motor skills. Children's readiness for learning a motor skill is not only by physical maturation but also by prior learning, cognitive functioning and motivational and attitudinal feelings concerning the task at hand. These elements may either stifle or challenge the desire or ability to be more physically active. The process of motor development should constantly remind us of the individuality of the learner. Age periods of development represent approximate time ranges during which certain behaviours may be observed. Over-reliance on these time periods would negate the concepts of continuity, specificity and the individuality of the developmental process (Gallahue, 1989).

Movement Education for Young Children

Gallahue (1989) proposed an educational model based on the proposition that the development of movement abilities occurs in distinct but often overlapping phases in each of the fundamental movement skills, which he labelled *categories of movement* (see Figure 1). Within the Gallahue (1989) model, children's optimal motor development would be achieved through participation in *fundamental movement skill themes* applied to the various *content areas and movement concepts*. The child's *major learning focus* would include exploration, discovery and a combination of current experiences with past experience, and be accomplished primarily through the teaching styles of exploration and guided discovery. The use of games, rhythms and self-testing activities, as well as the movement concepts of effort, space and relationships as programme content, is viewed as a means to increasing skill rather than as an end in itself.

Avery (1994) supported Gallahue (1987) and reinforced the position that the early years of childhood are the most crucial period in the development of gross motor skills. Avery proposed a model which included not only locomotor, nonlocomotor and

Grade level	**Preschool and Primary Grades**		
Characteristic phase of motor development	**Fundamental movement phase**		Initial stage Elementary stage Mature stage
Categories of movement	**Stability**	**Locomotion**	**Manipulation**
Fundamental movement skill themes	Axial movements Static balancing Dynamic balancing Landing Stopping Dodging, Etc.	Walking Running Jumping Skipping Climbing Etc.	Throwing Catching Kicking Trapping Striking Etc.
Applied to: 1. Content areas 2. Movement concepts	1. Self testing Games Rhythms	2. Effort Space Relationships	
Childs major learning focus	Exploration Discovery Combination (Indirect)		
Primary teaching Approaches	Indirect techniques Movement exploration Guided discovery		

Figure 1. Gallahue's (1989) conception of movement education for young children based on a model of gross motor development (p.507).

manipulative skills, but also the development of knowledge of movement concepts included in the categories of space awareness (levels, directions, pathways and ranges) effort (force, time and flow) and relationships with reference to objects or people. It was her position that through building movement awareness and using the discovery approach to learning, children could build the kinaesthetic foundation for later development of specific dance skills. Gabbard (1988) also emphasised that the first level of acquisition of efficient movement was the development movement awareness along with basic fundamental motor skills. This point of view provided motivation for the decision to focus this investigation on studying the effects of an expressive movement education programme on young children (one which emphasised the development of movement awareness and the exploration and guided discovery styles of teaching).

In reference to the developmental model (Gallahue, 1989) body, spatial, directional, and temporal awareness are generally associated with kinaesthetic perception, that is, information derived from within the body, as opposed to stimuli received from the environment (i.e. visual, auditory, and tactile information). A feature that makes this information uniquely appropriate for this period of child development is that several of the concepts associated with movement awareness are also the concepts basic to an early childhood movement education. The introduction of these concepts (e.g. directions, size, shapes, body parts) through the use of movement activities is a well-accepted teaching strategy that not only brings fun to the learning process, but may also enhance learning retention (Gabbard, 1988). Gallahue (1989) proposed that body awareness, spatial awareness, directional and temporal awareness which are components of movement awareness should include the development of the following perceptual-motor abilities:

- Awareness of self
- Gross motor control
- Fine motor control
- Kinaesthesis
- Eye-motor coordination
- Creative motor involvement, and
- Balance.

Expressive Movement Programmes

Applying the movement awareness components of movement education specifically to the expressive movement milieu, Hastie (1988) outlined the necessity of developing the pre-requisite skills of rhythm, time, space, quality and relationship and performance of single sequences and compositional experiments before focusing on refinement of specialised dance skills. Stinson, (1988; 1990) proposed that children three to seven years of age should have the opportunity to participate in an expressive movement education programme comprised of the following:

1. Experiences aimed at the development of control, coordination, balance, poise, and elevation in basic actions including travelling, jumping, turning, gesture, and stillness.
2. Experiences that encourage the exploration of contrasts of speed, tension, continuity, shape, size, direction, and level and describe what they have done.
3. Experiences working with a range and variety of contrasting stimuli, including music.
4. Experiences that encourage the exploration of moods and feelings through structured tasks.
5. Experiences that help to develop rhythmic responses.
6. Experiences making dances with clear beginnings, middles and ends.

An expressive movement programme may be conceived as a part of the movement education programme for young children. The content of the programme would therefore attend to the basic elements of a motor development model. Williams (1983) stated that any such model for early childhood learning must attend to the four foundations of gross motor development:

- Gross motor control
- Fine motor control
- Simple auditory, visual and tactile-kinaesthetic abilities
- Body awareness.

The application of a motor development model to expressive movement programme design would follow a pattern similar to this:

◊ Body awareness is defined as the conscious awareness and identification of the location, position and movement of the body and its parts and the relationship between the body and its parts (moving or stationary) to the external environment (Overby, 1992).

⇒ The construct of body awareness includes internal and external sub-components. The internal sub-components consist of awareness of the body and its parts including laterality, awareness of spatial dimensions of the body and identification of body parts. The external sub-components are those concerned with the interaction and interrelationship of the body and its parts with the environment.

⇒ Dance training emphasises body awareness in space as one of the key elements of successful movement. Some of the elements of space that directly relate to the external elements of body awareness are direction, floor patterns, levels and body shape. Through dance movement experiences, it is hypothesised that children develop a kinaesthetic sense that enhances their body awareness in space (Overby, 1992).

Pre-school children are typically within the beginning level of movement skill learning. Indirect teaching styles focusing on children's discoveries and promoting exploration are appropriate to implement at the pre-school level (Boucher, 1988; Cleland, 1990). According to the developmental model it is very important for pre-school children to discover the many different ways that their bodies can move within the three categories of fundamental movement skills of locomotion, manipulation and stability. Movement and sensory awareness are the primary ways children learn about themselves and their world (Stinson, 1990). Young children possess rich inner treasures, including the capacity to enter alternative realities - in which they may hear flowers growing, see spiders coming out of the sky, and become one with a small animal (Stinson, 1990).

Summary of Educational Programmes

Grineski (1992) identified three principles of motor skill development for children:

1. Motor skill development is sequential and age-related.
2. Children progress through similar sequences of motor development.
3. The rate at which children progress through sequences of motor development varies.

When applied to a comprehensive definition of developmentally appropriate movement content, these principles guide a movement education programme for children. According to The National Association for the Education of Young Children, the concept of developmental appropriateness has two dimensions: *age appropriateness and individual appropriateness* (Bredekamp, 1987). Human development research has indicated that there are universal, predictable sequences of growth and change that occur in all domains of development, but that each child is a unique person with an individual personality, learning style and family background. There may be wide individual differences in development due to age, sex, intelligence and socio-cultural differences that must be recognised in the skill acquisition process (Wall et al. 1990).

Through a directed programme of movement education, young children would have opportunities to develop and refine the fundamental movement patterns of nonlocomotion, locomotion, and manipulation along with the perceptual-motor skills and abilities considered to be critical elements in cognitive functioning. Participation could provide young children with feelings of success, the ability to participate in simple movement activities, and the motor skill foundation necessary for successful participation in sophisticated games, dances, and sports to be learned during later childhood (Grineski, 1988).

The rhythmical potential of young children makes participation specifically in an expressive movement programme a logical medium for learning. For many children, dance has the appeal and creativeness necessary to evoke the joy of movement. As a multisensory

experience, it allows children to learn through listening, touching, seeing and moving. The problem solving potential for exploratory learning and skill development is not limited to the psychomotor but includes cognitive and affective enhancement as well. Thus, expressive movement is proposed to be a significant medium for learning for the young child (Stinson, 1990).

> A child steps eagerly into the world of dance. In a class, he is free to move, he experiments with his own energy, with time, with space. He discovers the language of movement. He begins to speak through his body. (Joyce, 1993, p. vii).

Early childhood interventions are designed to provide perceptual-motor, cognitive, affective and social enrichment during a sensitive period of development. Their goal is to promote children's healthy development and to successfully negotiate the transition to school, and in the long run, to contribute to the prevention of poor adjustment outcomes such as motor and physical clumsiness, school failure and poverty. Studies of intensive experimental programmes have shown that one or two years of pre-school can improve children's perceptual-motor readiness, early academic achievement, and school competence such as lower grade retention and less special education placements. Some evidence indicated that pre-school participation contributed to longer term outcomes such as reduced school drop-out and delinquency as well as increased employment (Reynolds, 1994).

What the child experiences in early education programmes shapes future development (Weikart, 1989). Planned movement experiences should form an integral part of the early childhood curriculum. Numerous researchers have identified the ameliorative effects of environmental intervention on children's development (Berrueta-Clement, Schweinhart, Barnett, Epstein & Weikart, 1984; Lazar & Darlington, 1982).

Research has shown that most children do not receive enough fitness-enhancing activity during play experiences to develop an adequate level of motor skill development (Gilliam, MacConnie, Geenen, Pels & Freedson, 1982; Miller, 1978). Gallahue (1993) and Hankin (1992) maintain that the majority of early childhood educators are poorly informed on the importance of motor development and how to include such activities in their classrooms.

To the young child movement means life. Movement is an important factor in self discovery; movement means discovery of the environment; movement facilitates the development of the child's concepts of time, pace and direction; movement means freedom, movement means safety; movement is an important ingredient in communication; movement is sheer enjoyment and sensuous pleasure; movement means acceptance. Whitehurst (1971) concluded, "If movement means so much to the developing child, no further justification should be required for its inclusion among the major techniques in education" (p. 55).

In her address at a conference on the significance of the young child's motor development Omwake (1971) stated that "I have felt for some time that teachers have been paying too little attention to motor development, especially as it relates to self-confidence" (p. 12). Enhancement of body, spatial, directional and temporal awareness as a means of guiding the child toward improved movement control and efficiency in fundamental movement is worthwhile in itself (Gallahue & Ozmun, 1995).

Competency in movement is important for children socially, emotionally and physically. Children who score significantly below normal in the area of motor development are not likely to be included in the games of their more highly skilled playmates. They are also likely to experience problems in the area of peer relationships and self-esteem. Children who have not learned to perform isolated fundamental movement skills often experience frustration and failure when they are enrolled in sport or dance classes that require the performance of complex combinations of movement skills. Unless these children receive special help in improving their movement ability, they tend to have fewer friends, lower self-esteem, and increased health problems in later life due to their physical inactivity (Seefeldt, 1979). If through a programme of gross motor development activities a child learns to move and manage her body with confidence and ease then she should be able to function more efficiently in terms of movement for the rest of her life (Lerch et al., 1980).

Summary of Chapter Two

Early childhood education programmes for children from disadvantaged communities have been labelled early intervention programmes, environmental enrichment programmes or compensatory pre-school programmes. Such designations reflect the belief that these children experience inadequacies witching their of the environment that will have a limiting influence on their development as persons. In a collaborative study assessing the long-term effects of participation in early childhood education programmes on children from low-income families, Lazar and Darlington (1982) found lasting positive effects in four areas namely, school competence, developed abilities, children's attitudes and values and impact on the family. These effects apparently operated for all the children regardless of sex, ethnic background, initial ability level or early family bac':ground factors. The Perry Pre-school study, based on a programme of early intervention in the lives of low-income children, proposed that involvement in early childhood education can lead to increased school success (Berrueta-Clement et al. 1984). Children who had attended pre-school had better grades, fewer failing marks and fewer absences in elementary school; they required fewer special education services, were more likely to graduate from high school and were more likely to continue their educatior ..; get vocational training after school than their no pre-school counterparts.

It appears that appropriate pre-school programmes can offer an opportunity to for children to acquire an interest in learning, a willingness to try new things and to trust adults, a strong sense of independence, and to avoid negative behaviours such as misconduct, rejection of school and adults, and an inability to respond properly to adult requests (Schweinhart & Weikart, 1986). Of course, environmental factors such as health, nutrition, and family relationships also affect the perceptual-motor, cognitive, affective and social development of children (Werner, 1979). Evidence indicates that it is not simply family socio-economic status, parental intelligence or the physical characteristics of the home that directly affect a child's intellectual growth; rather, it is the way in which the environment is mediated by parents that either helps or hinders the child's development (Garber & Slater, 1983).

There is a high risk of developmental problems among many young South African children, due to their low socio-economic status, familial strain, violence, educational deficit and the pervasive change in South Africa (Dawes & Donald, 1994). For the last three decades in South Africa, 25% of African children who entered Grade One, dropped out after just one year of schooling. This means that at least one quarter of the African population do not remain in school long enough to achieve basic literacy (NEPI, 1992). Furthermore, studies have shown that within the previous Apartheid Education systems for Black and Coloured South Africans, there were high rates of learning problems, and repetition of grades and dropout (Dawes & Donald, 1994).

There are a large number of children in South Africa who attend pre-school. Some of these children have been exposed to extraordinary levels of emotional turbulence and too long periods of neglect, are seriously impaired in their ability to learn and to relate to others (Zimiles, 1986). However, many children in South Africa do not have access to resources such as pre-primary schools. Only 11% of South African children and 2% in rural areas are enrolled in early childhood development programmes (NEPI, 1992). Consequently, teachers in primary schools are faced with many children who enter Grade One who are not developmentally ready for school early school drop-out and scholastic failure are thus closely related to the lack of pre-school learning opportunities, especially for those from culturally disadvantaged communities (Jachens, 1997). There are recognised discontinuities between home and school for culturally different pre-school children and a lack of data exists about the nature of these differences, their distribution within given groups and how instruction could be adapted to take those factors into account. The [illegible] of quality pre-school programmes to assist these children must be determined through research in South African contexts.

Amidst the deep concerns about how to provide quality of early childhood education programmes, a focus on a quality perceptual-motor development programme must be given central attention. Learning to move skilfully cannot be left to chance. In the process of helping children learn to move - to develop movement literacy by helping them become skilful movers (Gallahue, Werner & Leudke, 1995), children can be encouraged to become thinking, knowledgeable movers, not robots producing movement patterns in specified ways, but individuals who can produce a variety of movement forms in response to the situational requirements. The development of the critical perceptual-motor abilities crucial

for subsequent academic and social success are important outcomes attributed to a movement education approach to perceptual motor development.

The literate mover is also an expressive mover being able to express, manipulate and vary movement patterns under a variety of conditions (Gallahue et al. 1995). Through movement and play children learn more than motor skills, children can learn to employ cognitive strategies, to understand their psychological self, and how to interact with other children (Zaichowsky et al. 1980). An expressive movement programme may have special potential to contribute to children's holistic development because it draws upon their creative abilities as well as extends their motor skill development, and it empowers them to make decisions and to interpret their world. It is within a broad commitment to determining optimal approaches to early childhood education, then, that this study was designed to explore the potential of an expressive movement programme to contribute to the gross motor development, the visual motor integration, and the development of self-concept of young children from a disadvantaged community in South Africa.

Chapter 3

Methodology

The purpose of this study was to determine the effects of participation in an expressive movement programme on the development of gross motor co-ordination, visual-motor integration and self-concept of young children from a disadvantaged community. The research approach used in this investigation was quantitative and descriptive in nature. The data gathered was analysed to provide descriptions of the impact of participation in the expressive movement programme on the three dependent variables.

Procedures

A multi-phasic plan was used to organise this investigation.

- Phase 1: A literature search was conducted by the Information Systems Division of the Medical Research Council in Tygerberg using PSYCINFO. A further literature search was completed at the [illegible] Delport Library at the University of Port Elizabeth utilising the com[illegible]ata-bases of SABINET, SPORT DISCUS, ERIC, PSYCHLIT, ISAP and MEDLINE.

- Phase 2: The initial design of the expressive movement programme (consisting of 14 lesson plans of 25 minutes duration each) was completed. The programme and lesson plans are presented in Appendix A.

- Phase 3: A five-week pilot study was completed during which 12 five-year old children participated as subjects. The purpose of this pilot study was to confirm the developmental appropriateness of the content of the expressive movement programme. The pilot study also allowed the investigator to identify and resolve potential problems pertaining to administration of the three assessment instruments selected for use in this study. Children who participated in the pilot study were not included in the full study.

- Phase 4: Participants were identified for participation as subjects in the expressive movement programme.

- Phase 5: The pre-test assessment battery was administered to all the subjects in both experimental Group 1 and Group 2. This battery included *the Charlop-Atwell Test of Gross Motor Co-ordination*, the *Beery Developmental Test of Visual-motor Integration* and the *Primary and Pre-school Self-concept Scale*. Completion of the pre-testing phase required a period of 16 days.

- Phase 6: The expressive movement programme was presented to experimental Group 1 only. The children participated in a twenty-five minute period, offered two time per week for seven weeks (14 lessons). The children in Group 2 received no intervention programme.

- Phase 7: Post-test 1 was then administered to the children in both experimental Group 1 and Group 2. The total time needed to administer the post-test battery 1 was 16 days.

- Phase 8: The expressive movement programme was presented to experimental Group 2 only. The children participated in a twenty-five minute period, offered two time per week for seven weeks (14 lessons). The programme was identical to that received during Phase 6 by the children in Group 1. The children in Group 1 received no additional intervention programme in Phase 8.

- Phase 9: Post-test 2 was then administered to the children in both experimental Group 1 and Group 2. The total time needed to administer the post-test battery was 16 days.

- Phase 10: The data was analysed using the BMDP programme for descriptive and inferential statistics. Analysis of variance and co-variance were applied to the 2 (group) x 2 (gender) x 3 (test) repeated measures factorial design.

- Phase 11: The presentation of the results of this investigation in dissertation format.

Design

Although the design of this study was empirical, it was conducted entirely in the field and the assessment instruments are regarded as indirect measures. This means that the study can be accurately described as an example of a quasi-experimental design. It is accepted that the quasi-experimental design cannot control all the factors that affect research with real people in real communities, as is the case with laboratory-based research (Lazar & Darlington, 1982). In order to maximise the integrity of this investigation the "time-series design with switched replication format" was used. This time-series format is considered by some researchers to be one of the best quasi-experimental designs since the effect of the treatment variable can be compared prior to and following intervention for multiple groups (Ignico, 1991).

A 2 (group) X 2 (gender) X 3 (test) repeated measures factorial design was utilised (see Table 2).

Table 2. *The Time Series Experimental Design*

Gr1	Pre1	Int	Post1		Post2
Gr2	Pre1		Post1	Int	Post2

Gr1 = Experimental Group 1, which consisted of participants from two different schools comprising two classes from each school.

Gr2 = Experimental Group 2, which consisted of participants from two different schools comprising two classes from one school and one class from the other school.

Pre1 = Pre-test, which included the assessment of all three dependent variables, namely, gross motor co-ordination, visual-motor integration and self-concept for every participant in both experimental Group 1 and Group 2.

= No intervention for seven weeks duration; acting as a control group.

Int = The intervention in the form of the expressive movement programme, which was presented as 25 minute lessons offered twice for seven consecutive weeks.

Post1 = The first post-test assessment which took place immediately after the completion of the seven-week expressive movement programme intervention for Group 1. Procedures followed during the pre-test were replicated.

Post2 = The second post-test assessment which took place immediately after the completion of the seven-week expressive movement programme intervention for Group 2. Procedures followed during the pre-test were replicated.

The time-series design derives its power from its control for most threats to internal validity and from its ability to maintain external and construct validity (Cook & Campbell, 1979). If the researcher discovers similar effects in experimental Group 1 and Group 2, it is likely that they were produced by the intervention (Ignico, 1991). The "switched replications" design is also regarded as useful for detecting effects that may be influenced by unpredictable delay periods (Cook & Campbell, 1979).

Selection of Participants

The investigator approached the Early Learning Centre in Port Elizabeth to obtain a list of public Pre-primary schools in the western suburbs of Port Elizabeth (a so-called "Coloured" area). The heads of the schools were then telephonically contacted and informed about the investigation. If they indicated a willingness to co-operate and participate a personal interview was organised and planning and organisational matters were clarified. The initial sample consisted of 170 pre-school children. Due to political unrest and violence in the area and a lack of interest in participation in the expressive movement programme on the part of some of the parents, teachers, and children, sample randomisation could not be achieved. Thus, a non-probability sampling technique of *convenience sampling* had to be used. This type of sampling may not be representative of the wider population.

The four pre-primary schools totalling seven classes which indicated a willingness to co-operate were situated within a geographic area of 12 km from one another. All the schools were involved in feeding schemes and provided physical nourishment in the form of

bread during break to provide for the hungry. Two non-equivalent groups were formulated from the children in these four schools. Parental consent was obtained and each child was a voluntary participant in the expressive movement programme as well as all pre- and post-test periods (see Appendix B).

During early childhood gender differences are minimal (Gallahue & Ozmun, 1995). For the purpose of this investigation, 84 of the selected subjects were male and 86 were female. Due to a high school drop-out rate and illness during the various assessment periods, the sample size decreased to 117 participants of which 65 were boys and 52 were girls.

Socio-economic status refers to the differences among families in income, educational background, occupational prestige, place of residence, lifestyle and relative autonomy and power. It is part of a child's early self-concept, perceptions of others and motivations (Schickedanz, York, Stewart & White, 1990). Because it was the purpose of this investigation to focus specifically on culturally disadvantaged children, participants were selected from an area of predominantly middle to low socio-economic status. The subjects were either English or Afrikaans speaking. Communication with the children, including programme presentation and assessment, were conducted in the children's home language. One of the selected schools was Afrikaans medium while the other three were dual-medium.

The Assessment Instruments

Three different assessment instruments were utilised to evaluate the status of the subjects: the *Charlop-Atwell Scale of Gross Motor Co-ordination* (1980), the *Beery Developmental Test of Visual-Motor Integration* (1982) and the *Primary and Pre-school Self-concept Scale* (1982). All three assessment instruments were administered during the pre-, post-1 and post-test 2 periods. The *Charlop-Atwell Scale of Gross Motor Co-ordination* and the *Primary and Pre-school Self-concept Scale* were administered individually, while the *Beery Developmental Test of Visual-Motor Integration* was administered in a group setting of eight children per group. These instruments are considered developmental screening tests which measure abilities found to be highly

associated with future scholastic achievement and success (Meisels, 1987). The rationale for selection of each of these measuring instruments will be discussed below.

The Charlop-Atwell Scale of Gross Motor Co-ordination

The *Charlop-Atwell Scale of Gross Motor Co-ordination* was designed to assess gross motor co-ordination in children of four through to six years of age (Charlop & Atwell, 1980). It was used as a screening device and not for detailed diagnosis of motor developmental difficulties. Many of the other scales of motor co-ordination seem to fall short in that they either lack evidence of acceptable validity, reliability or standardisation, are time-consuming and tedious to administer, or require expensive special equipment. In addition, a finer distinction was needed to compare children in terms of the quality of their performance on appropriate age-levels terms.

Charlop and Atwell (1980) believed that the assessment of gross motor co-ordination should include the ability to perform certain tasks as well as the quality of the performance. Since an objective score alone does not necessarily reflect the fineness or smoothness of performance of a task, it may not differentiate between two children who could both perform the task but not with equal ease and precision of movement. This quality of performance is an important dimension, which has been excluded from the existing motor co-ordination scales.

The Charlop-Atwell Scale consists of two sub-tests:

1. An objective sub-test was designed to measure the accuracy of performance.
2. A subjective sub-test was designed to measure the quality of performance of a motor task.

Both variables of process and product are considered as components of the composite score, thus revealing the what and how of the performance and looking closely at each individual child.

Since the scale was designed to measure gross motor co-ordination, the items are geared toward the utilisation of the entire body. Six items were selected primarily because they provide insight into developmental trends in performance as well as individual

differences within each age level. All six items appeared to be intrinsically motivating and enjoyable to the children. The scale with complete instructions and scoring criteria for each item are presented in Appendix C.

- The tiptoe-balance item measures static balance.
- The hopping on one leg item is a measure of dynamic balance.
- The jumping jacks and the prehistoric animal items measure the co-ordination of the upper limbs with the lower limbs.
- The jump and about face and scarf twirl items assessed the child's ability to co-ordinate two simultaneous actions.

In addition to the ability to perform a pre-learned task, two important facets of gross motor co-ordination are the speed and accuracy of acquiring a new skill.

- The scale items prehistoric animal and jumping jacks utilised learning trials as a measure of " motor educability"(McCloy, 1968). The subjects were tested on how quickly they learned the task as well as on the quality of their performance.

The scoring criteria for the Charlop-Atwell Scale of gross motor co-ordination is explicitly defined on the scoring sheets. The explicit nature of scoring also fosters high inter-observer reliability. The test battery demonstrated acceptable reliability at an inter-observer reliability Pearson Product-moment correlation coefficient of 0.95. The test-retest reliability for five-year olds is 0.91.

The Beery Developmental Test of Visual-motor Integration

The developmental test of visual-motor integration was designed for pre-school and early grade level children as a screening instrument assessing sensorimotor development. It is relatively culture independent and consists of a sequence of twenty four geometric forms to be copied with pencil on paper, arranged from simple to complex. According to the work of Barsch (1965), Hunt (1961), Piaget (1952) and Vereecken (1961) intelligence and achievement have a sensorimotor basis in development: higher levels of thinking and behaviour require integration among sensory inputs and motor actions. Kephart (1960)

emphasised the importance of integration, noting that a child can have well-developed visual and motor skills but be unable to co-ordinate the two abilities.

Beery (1982) compiled a developmental age and developmental characteristics for each of the geometric forms with the interjudge reliability correlation of 0.93. The administrator of the test within this research was a registered psychometrist who took responsibility for scoring each participant's response. The administration and scoring system of the Beery Developmental test of Visual-motor integration are provided in Appendix D.

The Primary and Pre-school Self-concept Scale (PPSC)

The PPSC scale used pictorial stimuli and responses and verbal directions in a semantic differential format. The measure thus met the need for a self-concept test for children who cannot read and or whose oral expressive skills were limited (Stager & Young, 1982). The semantic differential format was appropriate because it permitted examination of three dimensions of self-concept:

- Direction (whether the subject viewed the self favourable or unfavourably)
- Intensity (how strongly favourable or unfavourable the child's feelings about the self were)
- Content (what dispositions the child viewed the self to have).

The reliability of the composite semantic differential was computed using the omega coefficient and was found to be 0.72 which is at an acceptable level. The administration and scoring of the PPSC are presented in Appendix E.

Statistical Analysis

The BMDP statistical analysis procedures were followed. Descriptive and inferential statistics using analysis of variance and co-variance with repeated measures for the 2 (Group) X 2 (Gender) X 3 (Test) factorial design were applied (Brown, Engleman & Jenrich, 1990). Throughout the performance of the statistical analysis the 5% level was set as the confidence level.

Summary

Henderson and Sugden (1992) advocated for interactive research into the area of movement skills and other areas of children's development. Within this spirit, this study focused on determining the effect of participation in an expressive movement programme on young children's gross motor co-ordination, visual-motor integration as well as their self-concept. A time-series design with staggered single treatment was employed. This design is considered by some researchers to be one of the best quasi-experimental designs because the effect of the treatment variable can be compared prior to and following intervention for multiple groups (Ignico, 1991). When the investigator can demonstrate similar effects in two groups, it becomes more credible that they were produced by the intervention (Jones, 1985).

Chapter 4

Results and Discussion

Data related to the research hypotheses that guided this investigation were gathered from 117 children using a pre-test battery administered at the onset of their entrance into pre-school. An expressive movement intervention programme was then provided for the childern, they were re-tested, and then data were processed to describe the impact of the programme the gross motor co-ordination, visual-motor integration and self-concept of the participants.

The social milieu and physical environment affects children's access to movement stimulation, exploration and the discovery processes of learning; which can influence the movement background and movement culture with which they enter school. Herbert and Katzenellenbogen (1995) identified culture as a prominent variable in the differentiation of creative movement performance of white, so-called coloured and black children in South Africa. All participants in the investigation were representative of the so-called coloured community dwelling in the western suburban area of Port Elizabeth in an effort to control one aspect of culture in programme designed, implementation and the interpretation of results. To investigate the effect of participation in an expressive movement program on the development of the three dependent variables, the results will be presented and discussed according to the stated hypothesis.

For the purpose of data analysis and interpretation, the participants were divided into two experimental groups (Gr1 and Gr2) to conform to a quasi-experimental approach with non-equivalent grouping in a repeated measures design that utilises analysis of variance and covariance as statistical techniques. Analysis of variance is a general statistical procedure for analysing data obtained from an experimental design with one or more levels of the independent variable and one or more independent variables (Christensen, 1997). Analysis of covariance is a tehnique used to adjust the dependent variable for a covariate (distractor) variable by correlation and then the analysis of variance is calculated on the adjusted dependent variable. Analysis of covariance is a combination of regression and analysis of variance (Thomas & Nelson, 1990).

Hypothesis One

Gross motor co-ordination deals with the skilful use of the total body in large muscle or gross motor activities that require temporal and spatial co-ordination of the movement of a number of body parts or segments sequentially or simultaneously performed. Gross motor co-ordination is an essential component of the perceptual motor-development of children and must be effectively developed in order to optimise the learning potential of every child. Early childhood represents the most critical developmental period for the perceptual-motor development of the child. It is the period characterised by the mastery of fundamental movement skills. It was therefore a reasonable to expect that the participants would progress in terms of gross-motor co-ordination through participation in an expressive movement programme. This expectation led to the formulation of the first hypothesis tested in this study:

> *Hypothesis 1:* Participation in an expressive movement programme will facilitate the development of the gross motor co-ordination of young children.

This hypothesis was strongly supported by the data collected in pre- and post-test assessments. Both experimental groups achieved a statistically significant improvement in gross motor co-ordination score after participation in a seven-week expressive movement programme. Statistical processing included t tests and analysis of variance and covariance to determine the direction (positive or negative) and the level of significance of the changes which occurred as a result of the intervention.

The Charlop-Atwell Gross Motor Co-ordination Scale (CAGMCS) is comprised of an objective subtest score based on accuracy of movement performance and a subjective subtest score based on quality of movement performance (Charlop & Atwell, 1980). The test items are geared specifically to assess the following components of gross motor co-ordination: static and dynamic balance, co-ordination of the upper and the lower limbs and the speed and accuracy of gross motor skill acquisition. Throughout the discussion of the results the total CAGMCS score will be utilised as it is considered to be reflective of an integrated approach to the specific underlying components of gross motor co-ordination under investigation. Descriptive statistics of the data are presented in Table 3.

Table 3

Descriptive data on the development of gross motor co-ordination.

Variable	Exp Group	N	Mean	SD	Coefficient of variance	Smallest value	Largest value	Range
Pre-CAGMCS	Gr1 & Gr2	117	55.90	9.04	0.16	10.00	72.00	62.00
	Gr1	49	57.51	7.97	0.13	32.00	69.00	37.00
	Gr2	68	54.75	9.62	0.18	10.00	72.00	62.00
Post 1 - CAGMCS	Gr1 & Gr2	117	60.10	8.61	0.14	29.00	72.00	43.00
	Gr1	49	63.28	6.32	0.09	46.00	72.00	26.00
	Gr2	68	57.80	9.32	0.16	29.00	72.00	43.00
Post 2 - CAGMCS	Gr1 & Gr2	117	61.77	7.30	0.11	26.00	72.00	46.00
	Gr1	49	61.85	6.95	0.11	41.00	72.00	31.00
	Gr2	68	61.72	7.59	0.12	26.00	72.00	46.00
Age	Gr1 & Gr2	117	5.39	0.36	0.06	4.85	6.93	2.08
	Gr1	49	5.27	0.24				
	Gr2	68	5.48	0.39				

An investigation of the means reported in Table 3 indicated that the combined experimental groups showed considerable improvement in gross motor co-ordination immediately following the seven- week intervention programme. Ignico (1991) also found significant gains in the motor skill performance of pre-school children from a low socio-economic background following participation in a competency-based instructional movement programme. It is essential to note that the standard deviation decreased after intervention, indicating a smaller spread of scores about the mean. This indicated that there was a reduction in the variability of gross motor co-ordination among the participants after programme participation. The mean CAGMCS scores obtained by experimental Group 1 and experimental Group 2 were presented in Figure 2. This graph illustrated the substantial

gains in gross motor co-ordination found immediately after the intervention programme was completed.

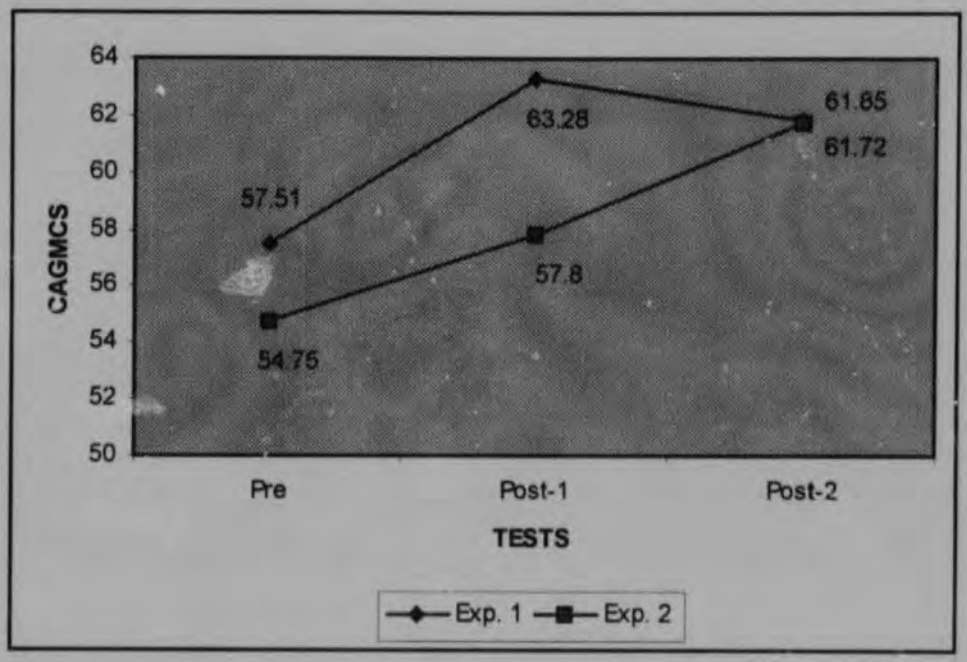


Figure2. Development of Gross Motor Coordination.

To determine the significance of the changes in the gross motor co-ordination of the participants in both experimental groups, analysis of variance and covariance were performed on the data. The results are presented in Table 4. Analysis of variance for gross motor co-ordination yielded statistically significant differences between the two experimental groups, $F(1, 111) = 8.81$, $p < 0.01$ for the covariant, level of assessment. The covariance of gross motor co-ordination at the pre-test level was statistically significant, $F(1, 111) = 100.00$, $p < 0.01$. Similar statistical significant results were obtained at the post test 1 and post test 2 levels at $F(1, 111) = 24.26$, $p < 0.01$ and $F(1, 111) = 35.62$, $p < 0.01$, respectively. Thus a significant correlation was found for gross motor co-ordination across all three levels of assessment, indicating a linear relationship and a similar developmental pattern over a period of time.

Table 4

Analysis of variance and covariance with repeated measures for gross motor co-ordination.

Source	SS	df	S	F	*p*
Gr1 & Gr2	286.05	1	286.05	8.81	0.0037*
Gender	5.16	1	5.16	0.16	0.6909
Gr1 & Gr2 x Gender	365.46	1	365.46	11.25	0.0011**
Covariance					
Pre- PPSC	3248.05	1	3248.05	100.00	0.0000***
Age	0.61	1	0.61	0.02	0.8904
All covariates	3356.01	2	1678.00	51.66	0.0000
1 Error	3605.51	111	32.48		
Gr1 & Gr2	45.21	1	45.21	1.01	0.3159
Gender	14.20	1	14.20	0.32	0.5734
Gr1 & GRr x Gender	23.38	1	23.38	0.52	0.4703
Covariance					
Post 1 CAGMCS	1078.10	1	1078.10	24.26	0.0000***
Age	134.70	1	134.70	3.02	0.0848
All covariates	1135.50	2	1544.50	12.74	0.0000
1 Error	494.43	111	1.95		
Gr1 & Gr2	1.95	1	3.10	0.05	0.8275
Gender	3.10	1	2.11	0.08	0.7838
Gr1 & Gr2 x Gender	2.11	1	1463.48	0.05	0.8208
Covariance					
Post 2 CAGMCS	1463.48	1	191.01	35.62	0.0000***
Age	191.01	1	760.44	4.65	0.0332**
All covariates	1520.88	2	41.08	18.51	0.0000***
1 Error	4560.10	111			

* $p < 0.1$

** $p < 0.05$

*** $p < 0.01$

Although age as a covariate did not have a significant effect on the development of gross motor co-ordination, it played a significant role at the post test 2 level of assessment, $F(1, 111) = 4.65$, $p < 0.05$, indicating that the younger the child the greater the developmental impact of the expressive movement program. This finding is consistent with literature indicating that the early childhood years are associated children being in the fundamental movement phase, transcending from the initial elementary level to the advanced level which serves as an essential building block for performance in more specialized games, sport and dance activities. The investigator assumed that children nearing the age of 5.74 years should have reached the advanced stage of fundamental movement skills, ready to serve as an acquired movement vocabulary accessible for recall for any further advanced skill acquisition.

Table 5 presents post-hoc comparisons that were made to reinforce the powerfulness of the significant results obtained emphasising the impact of the expressive movement programme for the duration of the experimental design. The post-hoc comparison of the results obtained for gross motor co-ordination at the pre-test and post test 2 levels of assessment yielded statistically significant results: $t = 5.97$, $p < 0.01$. As all covariates were equivalent, the significant difference in gross motor co-ordination could be ascribed to participation in the expressive movement programme. These results are evidence of the critical value of early childhood movement experiences to the gross motor development of young children.

Table 5

One-sample t-test results for CAGMCS.

Variable	N	Mean	SD	Estimate	Std Error	t	*p*
Pre	117	55.90	9.04				
Post 2	117	61.77	7.30				
Post 2 vs Pre CAGMCS				0.41	0.06	5.97	0.0000***

In support of the first research hypothesis, the 7-week expressive movement programme was an effective means of facilitating the development of gross motor co-ordination for both experimental groups. Significant retention of the acquired gross motor co-ordination vocabulary was also achieved. In reference to the developmental model discussed in chapter 2 of this investigation, it can be concluded that the expressive movement programme addressed the gross motor developmental needs of the participants. All components of movement awareness such as body, spatial, directional and temporal awareness associated with kinesthetic perception were integrated into the movement content of the lessons, including the development of the perceptual-motor abilities of self-awareness, gross motor control, fine motor control, kinaesthesis, visual-motor integration, creative motor involvement and static and dynamic balance.

The time-series experimental design with staggered single treatment allowed for a comparison of the treatment effect immediately following intervention for both experimental groups as indicated in Figure 2. It is important to repeat the finding that both experimental groups showed significant improvement in gross motor co-ordination immediately following completion of participation in a 7-week expressive movement programme. A significant correlation was found for gross motor co-ordination across all three levels of assessment indicating a linear relationship and a similar developmental trend or growth pattern over time. Significant results were indicated in Table 4 at $F(1 , 111) = 100.00$, $p < 0.05$ at post-test 1 versus the pre-test level and at $F(1 , 111) = 24.20$, $p < 0.05$ at post-test 2 versus the post-test 1 level, respectively.

To summarise results on the first hypothesis, the conclusion is made to accept of the hypothesis that there is a significant improvement in gross motor co-ordination after participation in a seven-week expressive movement programme.

Hypothesis Two

Williams (1983) defined visual-motor integration as the ability to co-ordinate specific visual input with a specific motor output or response. In performing the Beery Developmental Test of Visual-Motor Integration (DTVMI), the participants had to copy a sequence of 24 geometric forms arranged in order from simple to complex. Performance of the drawing task involved perception of the figures, formulation of the plan of movement, motor programming and perception of the feedback information generated by the ongoing movement. In the process of drawing, children encountered planning, positioning and alignment problems which emphasised the complexity of drawing for children (Thomas & Silk, 1990). The DTVMI was designed to measure changes in eye-hand co-ordination that occur as children grow older. Therefore there is a strong positive correlation with chronological age (r=0.89).

The second hypothesis was formulated because eye-hand co-ordination is an essential prerequisite skill to ensure school readiness in youngsters. The educational value of participation in an expressive movement programme would be augmented if positive changes in visual-motor integration were an outcome.

> *Hypothesis 2:* Participation in an expressive movement programme will facilitate the development of the visual-motor integration of young children.

The Beery DTVMI provides the calculation of an age equivalent of the raw score obtained by each participant. Descriptive data on the development of visual motor integration of the children who participated in this study are presented in Table 6. Because the mean chronological age of the participants at the onset of this investigation was 5.34 years, Table 6 clearly indicated a considerable developmental lag pertaining to visual-motor integration, specifically at the pre-test level. These results beg the question of whether the learning experiences of children from a disadvantaged background have been developmentally appropriate in preparing them to face the visual motor integration challenges presented at school.

Table 6

Descriptive data on the development of visual-motor integration.

Variable	Exp Group	N	Age	SD	Coefficient of variance	Smallest value	Largest value	Range
Pre-VMI	Gr1 & Gr2	117	4.75	0.73	0.15	2.92	6.42	3.50
	Gr1	49	4.47	0.65	0.14	2.92	6.03	3.16
	Gr2	68	4.95	0.73	0.14	3.17	6.42	3.25
Post 1 VMI	Gr1 & Gr2	117	4.96	0.65	0.13	3.50	6.83	3.33
	Gr1	49	4.85	0.62	0.12	3.50	5.92	2.42
	Gr2	68	5.05	0.66	0.13	3.50	6.83	3.33
Post 2 VMI	Gr1 & Gr2	117	5.30	0.68	0.12	3.17	8.58	5.41
	Gr1	49	5.08	0.61	0.12	3.17	6.42	3.25
	Gr2	68	5.45	0.69	0.12	3.92	8.58	4.66
Age	Gr1 & Gr2	117	5.39	0.36	0.06	4.85	6.93	2.08
	Gr1	49	5.27	0.24				
	Gr2	68	5.48	0.39				

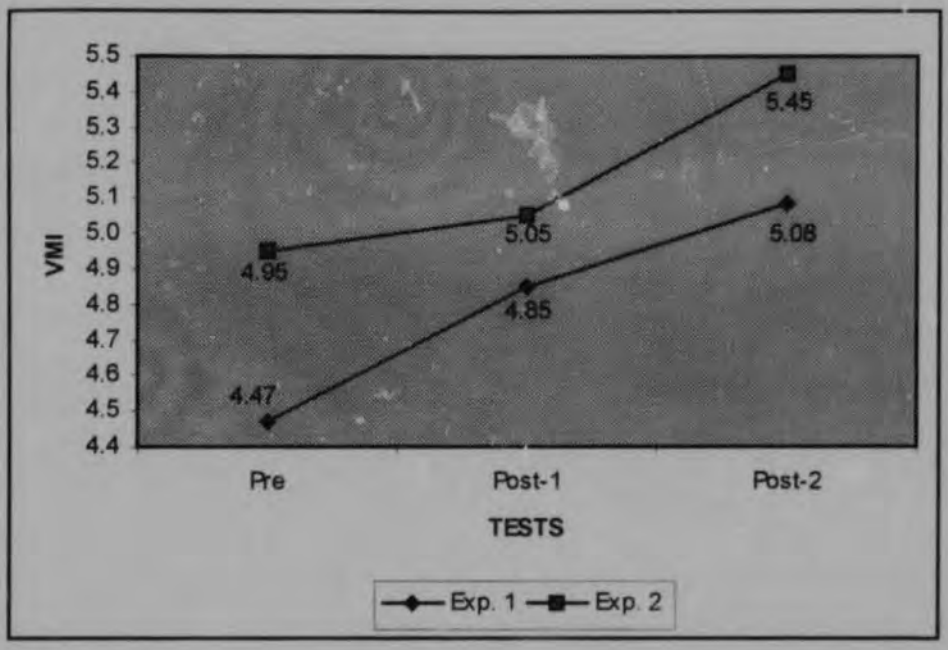


Figure 3. The Development of Visual-motor Integration.

Figure 3 presents the results in graph form, indicating that there was a positive impact of the intervention on the development of visual motor integration. There was a similar linear developmental pattern for both experimental groups.

The social milieu and physical environment are two components of the movement culture of children which impact on their movement stimulation, exploration and use of discovery processes in learning. Children frequently lag in their perceptual-motor development and learning if they experience sustained environmental restrictions (Gaber & Slater, 1983; Werner, 1979). Pretorius (1985) supported the observation that children from a geo-physical deprived milieu often lag in their development of perceptual-motor integration. These children are characterised as being isolated from those rich experiences which should have been theirs, brought about by poverty, by meagreness of intellectual

resources in the home and surroundings, including illiteracy of the parents. It is not only family socio-economic status, parental intelligence or the physical characteristics of the home that can have an adverse effect on the development of a child; rather, but also the way in which the environment is mediated by parents can either help or hinder the development process (Garber & Slater, 1983).

It could be argued that the children who participated in this study came from a previously disadvantaged background which may have provided inadequate access to visual motor integration experiences, such as in fine motor control and eye-hand activities. If such a deficit occurred, it would be a major contributor to incomplete visual-motor development. The family structure of these children who shared the same neighbourhood and a similar ethnic and cultural heritage, may have generated a psychological environment within the home which inhibited visual-motor development. The parental attitude and belief system regarding child rearing and education are basic mediating factors in creating deficiencies resulting from inadequate or inappropriate developmental experiences.

An investigation of the age equivalent means reflected an increase in the development of visual-motor integration throughout the three levels of assessment. This developmental trend is supported in literature. Frostig (1966) showed that the age span from 3 to 6 years is a time of both rapid and significant change in visual perception abilities. The period from 5 to 7 years is one of rapid growth in the perception of spatial relationships (Williams, 1983). Age-related changes in performance on the eye-motor co-ordination subtest of the Frostig Developmental Test of Visual Perception indicated a steady, almost linear improvement in visual-motor integration from age 5 to 10 years.

To ascertain the significance of the descriptive data, analysis of variance and covariance with repeated measures for visual-motor integration were performed, yielding the results presented in Table 7. Results of analysis of variance for visual-motor integration yielded statistically significant differences for the co-variant, level of assessment. At the pre-test level the covariance for visual-motor integration was statistically significant at $F(1, 111) = 63.32$, $p < 0.01$. Similar significant results were obtained at the post-test 1 and post-test 2 levels of assessment, respectively obtaining $F(1,111) = 97.22$, $p<0.01$ and $F(1, 111) = 66.59$, $p < 0.01$. These findings confirm a linear relationship revealing a similar developmental pattern pertaining to visual-motor integration over a period of time.

Table 7

Analysis of variance and covariance with repeated measures for visual-motor integration.

Source	SS	df	S	F	*p*
Gr1 & Gr2	0.05	1	0.05	0.21	0.6512
Gender	0.01	1	0.01	0.05	0.8300
Gr1 & Gr2 x Gender	0.03	1	0.03	0.13	0.7188
Covariance					
- Pre VMI	17.48	1	17.48	63.32	0.0000**
- Age	0.14	1	0.14	0.52	0.4732
All covariates	17.48	2	8.74	31.66	0.0000
1 Error	30.64	111	0.27		
Gr1 & Gr2	0.93	1	0.93	3.92	0.0501*
Gender	0.05	1	0.05	0.21	0.6443
Gr1 & Gr2 x Gender	0.14	1	0.14	0.61	0.4352
Covariance					
- Post 1 VMI	23.27	1	23 27	97.22	0.0000**
- Age	0.30	1	0.30	1.28	0.2608
All covariates	23 58	2	11.79	49.26	0.0000
1 Error	26.57	111	0.23		
Gr1 & Gr2	0.14	1	0.14	0.51	0.4759
Gender	0.05	1	0.05	0.19	0.6647
Gr1 & Gr2 x Gender	0.05	1	0.05	0.21	0.6449
Covariance					
- Post 2 VMI	18.69	1	18.69	66.59	0.0000**
- Age	0.02	1	0.02	0.09	0.7667
All covariates	19.00	2	9.50	33.85	0.0000
1 Error	31.15	111	0.28		

Despite the progressive narrowing in the variability of VMI scores, a wide range of VMI scores was evident among the participants in this study. The differences following participation in the intervention programme only approached significance at the post test 1 level at $F(1, 111) = 3.92$, $p < 0.0501$. Post-hoc comparisons of the significant F-values

yielded a statistically significant corresponding t-value in a one-sample t-test as indicated in Table 8.

Table 8

One-sample t-test results for VMI.

Variable	N	Mean	SD	Estimate	Std Error	t	*p*
Pre	117	4.75	0.73				
Post 2	117	5.30	0.68				
Post 2 vs PreVMI				0.57	0.07	8.16	0.0000***
Age		5.39	0.36	0.04	0.14	0.30	0.7667

The significant t-value indicated a positive improvement in visual-motor integration throughout the duration of the intervention period. Further research is needed to study the developmental lag in visual-motor integration displayed on the pre-test. Could this deficit be ascribed to a lower level of fine motor skill development or to the children's lack of knowledge of graphic conventions? Does the environment in which the children live include sufficient stimulation or is it a deprived environment? Do the children know how to access opportunities when they are in adequate environments? Several traditional theoretical approaches (Luquet, 1929; Piaget & Inhelder, 1956; Harris, 1963) suggested that children's drawings principally reflected their state of conceptual and intellectual development. Those children who participated in this study who were found to be developmentally behind their peers require some kind of remedial efforts immediately if their future involvement in school is to be successful.

To summarise results on the second hypothesis, the conclusion is made in support of the acceptance of the hypothesis whereby expressive movement provided appropriate movement experiences for the enhancement of visual-motor integration. It was disconcerting to note that even after a seven week intervention period, the developmental lag pertaining to visual motor integration was not fully rectified. It is recommended that a more direct approach towards enhancing visual integrating motor skills in pre school children be followed. This investigation proposes that the government commit themselves to providing levels of educational resources that are sufficient and inclusive of all children

irrespective of their culture, socio-economic status or market rules. This includes the provision of the kind of movement education that children need and deserve.

Hypothesis Three

Self-concept is a multidimensional construct linked to perceived physical competence. A stable, positive self-concept is so crucial to a child's ability to function effectively, that its development cannot be left to chance. The important contributions that expressive movement experiences could make to forming a positive self-concept was a major concern of this investigation.

The term self-concept, as used throughout this investigation, is the umbrella term under which several other variations of self could be categorised. Self-concept is generally viewed as one's awareness of personal characteristics, attributes and limitations and the ways in which these qualities are both like and unlike those of others. In response to the need stated in the literature to develop educational programmes that include the self-concept development of children in their objectives, the third hypothesis was conceived and tested:

> *Hypothesis 3:* Participation in an expressive movement program, will facilitate the development of the self-concept of young children.

The Primary and Pre-School Self-concept Scale was used for pre- and post-test assessments. Statistically significant support for this hypothesis was found. Since all three different methods of scoring the PPSC-scale led to similar results, this discussion will specifically focus on results yielded from the proposed third method of scoring, in which a high score is indicative of a positive self-concept and vice-versa. A total score of 28 represents the highest maximum score and a total score of seven represents the lowest minimum score.

The mean ratings obtained in the PPSC-scale indicated a high positive self-concept. This finding is consistent with literature indicating evidence of unrealistically high self-concepts among young children (Eccles et al. 1989; Marsh, 1989). It could be suggested

that the egocentric nature of young children and their high, less clearly differentiated self-concepts are relatively independent of external evaluation criteria. Descriptive data on the development of self-concept for the separate and combined experimental groups are reflected in Table 9, revealing a positive developmental trend.

Table 9

Descriptive data on the development of self-concept for the combined experimental group.

Variable	Exp Group	N	Mean	SD	Coefficient of variance	Smallest value	Largest value	Range
Pre – PPSC	Gr1 & Gr2	117	20.74	4.31	0.20	7.00	28.00	21.00
	Gr1	49	20.28	4.30	0.21	10.00	28.00	18.00
	Gr2	68	21.07	4.33	0.20	7.00	28.00	21.00
Post 1 – PPSC	Gr1 & Gr2	117	22.08	4.30	0.19	10.00	28.00	18.00
	Gr1	49	20.77	4.21	0.20	10.00	28.00	18.00
	Gr2	68	23.02	4.14	0.17	13.00	28.00	15.00
Post 2 – PPSC	Gr1 & Gr2	117	22.81	3.87	0.16	13.00	28.00	15.00
	Gr1	49	21.77	3.76	0.17	13.00	28.00	15.00
	Gr2	68	23.55	3.80	0.16	16.00	28.00	12.00
Age	Gr1 & Gr2	117	5.39	0.36	0.06	4.85	6.93	2.08

PPSC means presented in Table 9 indicate that the combined experimental groups realised an enhancement of their self-concept. There was also a decrease in the standard

deviation, indicating a smaller range in mean scores throughout all three levels of assessment. Figure 4 illustrates this positive developmental trend for the self-concept development of both experimental groups in graph form.

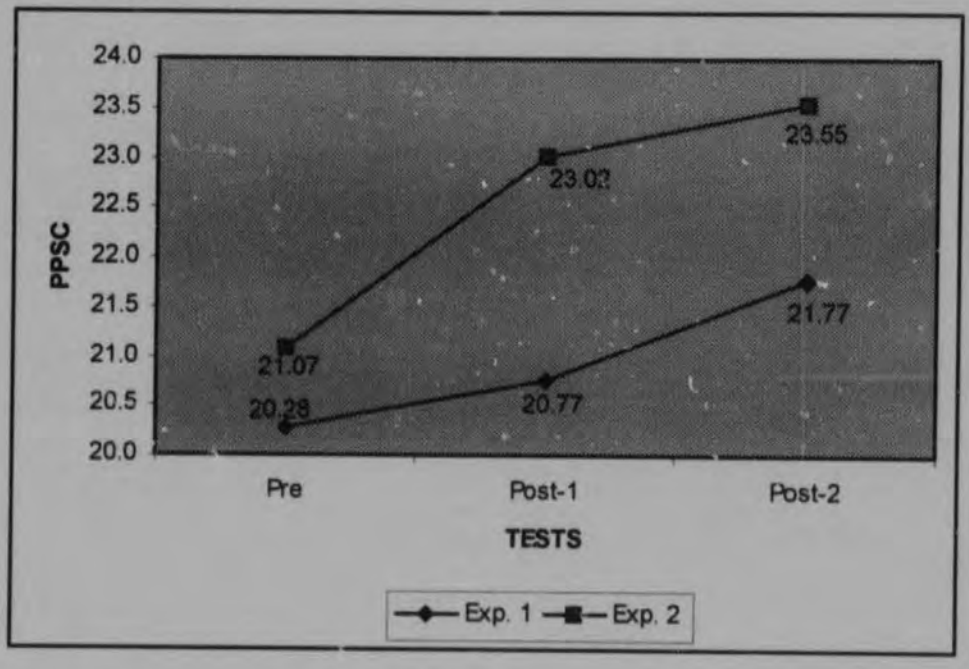


Figure 4. Development of Self-concept.

To ascertain the significance of the descriptive data, analysis of variance and covariance were performed, yielding results reflected in Table 10.

Table 10

Analysis of variance and covariance with repeated measures for self-concept development.

Source	SS	df	S	F	*p*
Gr1 & Gr2	112.30	1	112.30	9.71	0.0023***
Gender	4.65	1	4.65	0.40	0.5273
Gr1 & Gr2 x Gender	7.29	1	7.29	0.63	0.4289
Covariance					
- Pre PPSC	678.58	1	678.58	58.66	0.0000***
- Age	26.05	1	26.05	2.25	0.1362
All covariates	697.99	2	348.99	30.17	0.0000
1 Error	1284.06	111	11.56		
Gr1 & Gr2	15.11	1	15.11	1.81	0.1817
Gender	15.69	1	15.69	1.88	0.1736
Gr1 & Gr2 x Gender	0.60	1	0.60	0.07	0.7880
Covariance					
- Post 1 PPSC	614.31	1	614.31	73.41	0.0000***
- Age		1	37.64	4.50	0.0361
All covariates		2	344.40	41.16	0.0000
1 Error		111	8.36		
Gr1 & Gr2		1	90.38	9.03	0.0033***
Gender		1	21.67	2.17	0.1440
Gr1 & Gr2 x Gender		1	4.34	0.43	0.5113
Covariance					
- Post 2 PPSC		1	432.36	43.21	0.0000***
- Age		1	84.39	8.43	0.0044***
All covariates		2	253.42	25.33	0.0000
1 Error		111	10.00		

Results reported in Table 10 indicate a significant difference between the self-concept scores obtained for the two experimental groups for the covariant *level of assessment.* At the pre-test level the covariance for self-concept development was statistically significant at $F(1, 111) = 58.66$, $p < 0.01$. Similar significant results were

obtained at the post-test 1 and post-test 2 *levels of assessment*, alternately achieving $F(1, 111) = 73.41$, $p < 0.01$ and $F(1, 111) = 43.21$, $p < 0.01$. These findings are indicative of a linear relationship revealing a similar developmental pattern for self-concept development over a period of time.

It is essential to note that at the post-test 2 level in comparison to the post-test 1 level, the covariant *age* had a significant effect on the self-concept development of the child, $F(1, 111) = 4.50$, $p<0.05$. The latter finding indicated that the greatest impact of the intervention on the affective development of the child occurred before the age of 5.59 years. Post-hoc comparison supports the significant effect of age on the self-concept development of the young child, $t = -2.90$, $p<0.05$. If teachers of pre-school children facilitate the development of a positive self-concept as early as possible, then youngsters would be empowered to achieve optimum development.

The analysis of variance revealed no significant interaction effect between the variables. Post-hoc comparisons were performed on the significant F-ratio's obtained for the covariant *level of assessment* to determine the impact of the intervention programme. Both experimental groups revealed similar responses immediately after the intervention as indicated in Figure 4. Table 11 revealed a significant t-value obtained reinforcing the powerfulness of acquired results on the positive impact of the expressive movement programme on the self-concept development of the participants across the duration of this investigation.

Table 11

One-sample t-test results for self-concept development.

Variable	N	Mean	SD	Estimate	Std Error	t	*p*
Pre	117	20.74	4.31				
Post 2	117	22.81	3.87				
Post 2 vs Pre PPSC				0.45	0.06	6.57	0.0000**
Age		5.39	0.36	-2.49	0.85	-2.90	0.0044**

The warm and unconditional accepting relationship the children developed with the investigator together with the encouragement and praise received throughout the duration

of the intervention, allowed the participants to experience acceptance of themselves. This supports Van Zijl's (1985) finding that the experience of competence and significance are essential factors in the development of a positive self-concept. Nichols (1990) and Weiller (1992) reinforced that feelings of belonging, competence, self-worth, acceptance of self and limits and uniqueness are significant for healthy affective development of children. Throughout participation in the expressive movement programme, the children had the opportunity to demonstrate competence in the successful performance of the discovery and exploration of movement experiences. Encouragement and positive feedback were given throughout the program, enhancing exploration of movement ideas and enjoyment in participation.

Self-concept is established in the young child through the affirmation of significant others. Children increase their competence under the care of loving, capable and nurturing adults. The role of the teacher as a significant other in the life of the young school going child as facilitator of the development of a positive self-concept is to create a positive school environment empowering feelings of acceptance, confidence and control over their bodies and providing them with knowledge of their and other's potential for health and involvement in movement education and sport (Hargreaves, 1994).

This investigation does suggest that teachers are significant others in the lives of youngsters and as such play important roles in their self-concept development. The expressive movement programme used a developmental approach, emphasizing self-discovery and problem-solving through activities enhancing body awareness, spatial and temporal awareness. Because of the importance of vigorous play in the lives of children and the high value placed on physical ability by children, movement serves as an essential facilitator of a positive self-concept. Bigge and Shermis (1992) support the adoption of a cognitive view of learning that promotes student self-discovery and perceived competence through developmentally appropriate activities. A major core focus of the current re.. arch is to promote expressive movement as a stimulating and fascinating means of providing developmentally appropriate movement experiences for pre-school children.

In summary, the findings strongly supported the third research hypothesis reinforcing the notion that particpation in an expressive movement programme significantly enhanced the self-concept development of children specifically before the age of 5.59 year.

Gender Considerations

Recent literature indicated gender differences in all aspects of development throughout early childhood, to be minimal. Although the literature did not support the prediction of gender effects for any of the three variables studied in this research, it was decided to examine the data to confirm or challenge this conclusion. The results basically confirm the lack of gender effect. Descriptive data on the effect of gender on the three variables at the three levels of assessment are presented in Table 12.

Table 12

Descriptive data on the effect of gender on the three dependent variables.

Variable	Exp. Group	Gender	N	Age		Pre-test		Post test 1		Post test 2	
				Mean	SD	Mean	SD	Mean	SD	Mean	SD
CAGMCS	Gr1	M	24	5.34	0.26	56.16	7.22	64.08	5.46	61.54	5.51
		F	25	5.26	0.23	58.80	8.75	62.52	7.08	62.16	8.20
	Gr2	M	41	5.47	0.39	52.97	7.76	55.09	8.65	60.90	6.45
		F	27	5.49	0.40	57.44	11.56	61.92	8.92	63.25	8.98
VMI	Gr1	M	24	5.34	0.26	4.52	0.70	4.90	0.59	5.11	0.58
		F	25	5.26	0.23	4.43	0.62	4.80	0.66	5.05	0.65
	Gr2	M	41	5.47	0.39	4.98	0.65	5.06	0.58	5.11	0.68
		F	27	5.49	0.40	4.90	0.83	5.03	0.78	5.37	0.72
PPSC	Gr1	M	24	5.34	0.26	20.83	4.69	21.45	4.45	22.50	3.67
		F	25	5.26	0.23	19.76	3.91	20.12	3.96	21.08	3.79
	Gr2	M	41	5.47	0.39	21.24	4.06	23.09	4.24	23.85	3.82
		F	27	5.49	0.40	20.81	4.77	22.92	4.05	23.11	3.80

Gender and Gross Motor Co-ordination

Early childhood (approximately two to seven years of age) is associated with the fundamental movement phase of motor development. Movement components such as movement awareness, locomotor, non-locomotor and manipulative skills form the essential elements of gross motor development. All these movement skills have been incorporated into the expressive movement programme in which the children participated. During this early childhood stage gross motor control is developing rapidly and fine motor control has not been fully established yet.

The majority of findings in literature on gender effects in gross motor development in early childhood indicated differences to be minimal. Supporting literature by Gallahue and Ozmun (1995) and Ignico (1991) found no significant gender differences in the gross motor development of disadvantaged children with a mean age of 4.5 years. In South Africa, Pienaar (1993) did not find significant gender effects for children with gross motor developmental lag, although she did find a greater variance in the skill performance of boys. Current research results indicated superior gross motor co-ordination skill performance in girls together with a greater variance of scores prior to intervention. Immediately after completion of the seven-week expressive movement programme that formed the intervention in this study, the boys surpassed the girls in performance, maintaining a smaller variance. Literature indicated that one of the most dramatic characteristics of gross motor development in the preschool child is its great variability (Williams, 1983).

A normative study utilising the Charlop-Atwell scale of gross motor co-ordination found significant differences for boys and girls. The standardisation sample, however, was biased toward the upper-middle class income bracket and participants were from a white racial group. Descriptive data on the experimental sample indicated a similar trend as the female participants consistently achieved higher mean scores for gross motor co-ordination prior to the intervention. It is interesting to note that both boys and girls in the experimental group achieved higher mean scores than the participants in the normative group. Recognised discontinuities between home and school exist for culturally different pre-school children. A lack of data exists about the nature of these differences; their distribution within given groups and how teaching could be adapted to take these factors into account (Henderson, 1980). In the assessment of the culturally different pre-school

child, the first step has been taken in the implementation of an intervention strategy designed to encourage attainment of the highest capabilities of the youngster.

Post-hoc comparisons of the descriptive data indicated the effect of gender on the development of gross motor co-ordination were reported previously in Table 4. A statistically significant difference was found only when the experimental group x gender effect was calculated at the post-test 1 *level of assessment* for $F(1, 111) = 1.25$, $p < 0.05$. Boys and girls maintained a similar developmental pattern for gross motor co-ordination across the three levels of assessment, indicating a positive correlation for the scores obtained before and after intervention.

To summarise results on the effect of gender on the development of gross motor co-ordination, this investigation found that both boys and girls achieved significant improvements in gross motor co-ordination skills through participation in an expressive movement programme, and that the impact is greater at a younger age as the child progresses to the mature stage of fundamental motor skill acquisition. No statistically significant gender effect was found for the development of gross motor co-ordination.

Gender and Visual-motor Integration

Williams (1983) reported no significant differences between boys and girls at any given age in their development of visual-motor integration. Overall, boys as a group tend to be more variable than girls in their visual-motor co-ordination ability. Therefore, boys at any given age may show a wider range of scores than girls and consequently boys may be more likely to exhibit extreme levels of performance on a task. Both boys and girls are more variable at five and six years old than they are at ages eight or nine, where they reach maturity in terms of their visual-motor co-ordination.

Results obtained in this investigation on the effect of gender on the development of visual-motor integration supported findings in the literature. No statistically significant differences were discovered between boys and girls. Analysis of variance was performed to determine the significance of the gender effect on the development of visual-motor integration of the participants. Results reported previously in Table 7 revealed neither a statistical gender effect nor any interactional effects across the three levels of assessment. Results indicated that both boys and girls tend to progress steadily in a linear fashion

pertaining to the development of visual-motor integration. To summarise findings on the gender effect on visual-motor integration, pre-school boys and girls did not differ in their visual motor integration developmental pattern.

Gender and Self-concept Development

Previous empirical evidence on gender differences and self-concept development of children has been inconclusive. Van Zijl (1985) found no significant gender differences at the onset of an activity program for Afrikaans-speaking pre-schoolers from the middle socio-economic class. She did however find that the children evaluated themselves more negatively before implementation of a six week activity program compared to the evaluation of their peers in the normative group. After the intervention both boys and girls revealed enhanced self-concepts although results were not statistically significant. The finding supported the notion that the experience of competence and significance are essential factors in the development of a positive self-concept. Nichols (1990) and Weiller (1992) confirmed that feelings of belonging, competence, self-worth, acceptance of self and limits and uniqueness were significant for healthy, affective development in children. Stager and Young (1982) found a gender dimension in factor analysis of a self-concept measure for pre-school and early primary grade children, although results were not significant. Movement activities that are both developmentally appropriate and properly sequenced have been proposed as effective means for self-concept enhancement (Gallahue & Ozmun, 1995).

Analysis of variance to determine the significance of the gender effect on the development of self-concept of the children who participated in this study revealed no significant gender effect or interactional effect irrespective of the level of assessment. Both boys and girls indicated a significant improvement in self-concept after completion of the intervention programme. They reflected a similar developmental pattern throughout the duration of the experimental design. To summarise findings on the gender effect and self-concept development, no significant gender effect on the self-concept development of pre-school children were found.

Conclusion to Chapter Four

Analysis of results revealed significant improvements in children's gross motor co-ordination after participation in a seven-week expressive movement programme. Results indicated a significant increase in the mean scores obtained across the three levels of assessment revealing a linear relationship and a similar developmental pattern for the two experimental groups. Participants progressed from the initial elementary level to an advanced level of fundamental movement acquisition.

Although descriptive results indicated enhanced visual-motor integration scores immediately after intervention, statistical analysis only approached significance at $F(1, 111) = 3.92$, $p=0.0501$ at the post test 2 level in comparison to the post test 1 level. The wide range of VMI scores obtained by the participants resulted in reducing the significance of the treatment effect. Age played a statistically significant role at the pre-test and post-test 1 level of assessment, indicating that intervention for the enhancement of visual-motor integration was optimalised before the age of 5.59 years. A considerable developmental lag pertaining to visual-motor integration was exhibited prior to intervention which is cause for concern for the readiness of pre-school children to meet to scholastic demands. Further research on this issue within the multicultural diverse population in South Africa is deemed necessary.

Analysis of results revealed significant support for the third hypothesis. The expressive movement programme enhanced the self-concept development of the participants. Results are indicative of a linear relationship revealing a similar developmental pattern in both groups of children. The greatest impact of the intervention occurred before the age of 5.59 years emphasising the essential role the parents and teachers should play in the affective development of young children.

This investigation suggests the availability of greater access to early childhood education opportunities for all children in South Africa, particularly those from a previously geo-physical deprived milieu. The government, educationalists and parents need to recognise the essence of the foundation years of early childhood development. Implementation of appropriate pre-school programmes utilising expressive movement as a medium which proved to be developmentally appropriate, should be a priority in early

childhood education. Furthermore research into the changing developmental needs of youngsters in South Africa from a multi-cultural perspective is desperately needed.

Chapter 5

Conclusions and Recommendations

The purpose of this study was to investigate the influence of participation in an expressive movement programme on gross motor co-ordination, visual-motor integration and the self-concept of pre-school children. Rationale supporting this study was drawn from a body of literature predominantly selected from the domains of perceptual-motor development, educational dance pedagogy and child psychology. The study involved 117 pre-school children of which 65 were boys and 52 were girls of a mean age of 5.39, dwelling in the Western suburban area of Port Elizabeth in the Eastern Cape province. The Eastern Cape is the second largest of South Africa's nine provinces, and covers 14% of the country's total area. The province has the second largest school enrolment, with 2 294 505 learners at all levels in 1997, comprising about 18% of South Africa's total learner population (HSRC, 1996).

Three hypotheses were formulated and tested to determine the influence of the programme on the three dependent variables. The conclusions and recommendations of this investigation are presented in the following sections. Each of the three hypotheses are addressed in separate sections preceded by an introductory section on expressive movement. This introductory section provides the rationale for specifically selecting expressive movement as the medium for development throughout this investigation, as essential aspects worthy of independent discussion.

Expressive Movement

Engagement in expressive movement activities provides a meaningful way for pre-school children to develop gross and fine motor control, body awareness, kinaesthetic awareness, spatial- and temporal awareness, verbal understanding and inter- and intra-personal relationships (Schmidt & Nagata, 1983). The content of the expressive movement programme used throughout this investigation was developed to encourage the child to imagine, pretend, simulate and dramatise while using gross motor movement as a

medium. Utilising various elements of fundamental movement, the learning processes associated with active exploration, guided discovery, problem-solving and divergent thinking were applied in a highly explorative and experiential approach. The children were provided with a broad, comprehensive basis of movement experiences to enable development of their own movement resources, focusing on their level of fundamental motor development.

The fundamental movement skills of children entering school are too often incompletely developed (Gallahue & Ozmun, 1995). Five-year olds are in the fundamental phase of motor development representing a time in which they are actively involved in exploring and experimenting with the movement capabilities of their bodies. It is a time for discovering how to perform a variety of stabilising, locomotor and manipulative movements. Attainment of competence in fundamental movement abilities is influenced greatly by opportunities for practice, encouragement and instruction in an environment that fosters learning.

Many young South African children are exposed to adverse environmental and familial conditions. They may not receive adequate stimulation in their home environment in terms of perceptual-motor, social, affective and cognitive development. Lack of sufficient stimulation can lead to difficulties in developing in an age appropriate manner. Children may lag behind their peers in their perceptual-motor learning because of environmental restrictions. Cognitive development may also suffer because the cognitive processes and learning styles that children develop and utilise are closely linked to the socio-cultural environment in which they develop. Those processes are nurtured in collaboration with others or in social arrangements of children's activities (Pelligrini, 1991).

In contemporary approaches to early childhood education, perceptual-motor training is conceptualised as facilitating movement education through optimal use of as many sense modalities as possible. Proprioceptive, visual and auditory functioning are intricately related to understanding and appreciation of the body, self, space, time, force and flow. Knowing that the early childhood is a crucial period in the development of motor skills, movement experiences should involve locomotor, non-locomotor and manipulative skills in addition to the development of knowledge of movement concepts included in the categories of space awareness, effort and relationships (Avery, 1994).

Despite agreement on the importance of perceptual-motor training and movement education, there is a great diversity in early childhood education programmes, which has resulted in varied curriculum practices. In selecting the most appropriate movement content, the pre-school physical education teacher needs to consider that young children do not think of learning as being fragmented. Development in all areas - motor, physical, affective, social and cognitive - is integrated and pre-school curricula as such should focus on themes which tie together learning in various subject areas. Advantage should be taken of the children's imagination through the use of a variety of activities, including drama and imagery.

Expressive movement provides exceptional opportunities to integrate all learning areas through interpretive and communicative movement experiences. It involves exploring movement organised around themes that are significant to children, emphasising sensory awareness and including a cognitive component as children learn about movement concepts dealing with the body, space, time, energy and relationships. Through exploration and discovery children build a rich store of sensory-motor experiences, laying a foundation on which abstract concepts and more complex skills can later be built (Stinson, 1988).

Children can experience a kind of fulfilment through expressive movement that can be realised through no other movement form, because dancing simultaneously involves the inner being and the physical body. In expressive movement, children are not concerned with a game, an object or even another person. Their concentration and awareness is fixed on the act of moving - of dancing. Because of their focus, children discover a great deal about their bodies, mind, language, thoughts, imagination and ideas through expressive movement (Joyce, 1980).

Through participation in an expressive movement programme, children learn both awareness and control of movement. Movement as creative expression plays an important part in life, building self-concept, self-awareness and self-direction. This self includes not only the body, not only the mind, not only the feelings, but also the holistic experience of being human.

Hypothesis One

Early childhood is a critical period characterised by the development of the gross motor co-ordination which is an essential building block for the development of fundamental motor skills. In order to justify inclusion of an expressive movement programme as part of the pre-school movement education curriculum, it must be demonstrated that participation in such a programme will enhance the development of gross motor co-ordination. Hypothesis one was formulated to test this.

> Hypothesis 1: Participation in an expressive movement programme will facilitate the development of the gross motor co-ordination of young children.

The first hypothesis is accepted. The data revealed a significant improvement in the gross motor co-ordination of both experimental groups according to the post-test administered immediately after their completion of the intervention programme. Furthermore, results indicated that the younger children gained the most benefit through participation. These finding are congruent with reported literature. Planned movement experiences ensure that sensitive periods for acquiring motor skills are not neglected. Motor skill acquisition in early childhood is a fairly sequential process influenced by both maturation and experience. At certain times children reach sensitive periods, during which skills are acquired with the least expenditure of time or energy. Many of the participants in this investigation progressed from the initial elementary stage to the mature stage of fundamental motor skill development.

Although it cannot be documented, the investigator maintains that the expressive movement programme addressed the development of gross motor co-ordination in a unique way. All components of movement awareness such as body, spatial, directional and temporal awareness associated with kinaesthetic perception were integrated into the movement content of the lessons, including the development of the perceptual-motor abilities of self-awareness, gross motor control, fine motor control, kinaesthesis, visual-motor integration, creative motor involvement and static and dynamic balance.

Hypothesis Two

Visual-motor integration has been defined as the ability to co-ordinate specific visual input with a specific motor output. It is considered to be an essential prerequisite to school readiness. Eye-hand co-ordination involves perception, the formulation of a movement plan, motor programming and perception of the feedback information generated by the ongoing movement. If participation in an expressive movement programme could contribute to visual motor integration, it would strengthen the argument to include this content as part of pre-school movement education curriculum. The second hypothesis was formulated to test this.

> Hypothesis 2. Participation in an expressive movement programme will facilitate the development of the visual motor integration of young children.

The second hypothesis cannot be accepted. Although support for the second hypothesis was found, statistical significance was not achieved. The data revealed a wide range of VMI scores. There was considerable developmental lag evident for many of the children according to their pre-test scores. This indicated that their prior learning experiences had been inadequate in providing the visual-motor integration challenges needed to achieve the development level needed to meet normal pre-school expectations. This finding supports research that has identified visual-motor integration as a particularly sensitive predictor of socio-economic status. It is during the early childhood years that environmental deprivation could have the most disastrous effects. Further, it may be more difficult to compensate for neglect later in life. Although results of this study indicated a linear developmental pattern for both experimental groups, it failed to close the developmental lag completely.

Hypothesis Three

For the purpose of the current investigation, self-concept as a general and global construct, defined as the perception of the self in terms of attitudes, feelings and knowledge about abilities, skills, appearance and social acceptability, were dealt with. The development of self-concept is considered a critical variable in education and as knowledge of children in South African culture is sketchy and incomplete, research in this area is much needed. Reported literature indicated that teachers are significant others in the lives of children and as such play essential roles in their self-concept development. In response to the stated need the third hypothesis was formulated and tested.

> Hypothesis 3: Participation in an expressive movement programme will facilitate the development of the self-concept of young children.

The third hypothesis is accepted. The data revealed statistically significant support of the third hypothesis indicating the positive impact of the expressive movement programme on the self-concept development of the participants. A furthermore significant finding revealed that the greatest impact of the intervention on the self-concept development of the youngsters occurred before the age of 5.59 years. Findings indicated a high positive self-concept among the participants in support of stated literature indicating a generally high self-concept among pre-school children and first-graders. It could be reasoned that their egocentric nature as well as their less clearly differentiated self-concepts are relatively independent of external evaluation criteria such as socio-economic status.

By successfully providing expressive movement responses to challenges, the children gained confidence and competence in their abilities within a secure environment. Encouragement and positive feedback were given throughout the programme, enhancing exploration and discovery of movement possibilities and focusing on enjoyment through participation. The implication for teachers is that they should recognise their role as facilitators in the development of a positive self-concept and as creators of a positive school environment. Through expressive movement and dance education, they can empower children by developing feelings of acceptance and self-confidence. Reported literature indicated that feelings of belonging, competence, self-worth, acceptance of self and limits and uniqueness are significant for healthy affective development in children.

Because research has revealed the existence of a reciprocal relationship between self-concept and academic achievement, the attitudes that children hold about themselves and their abilities would strongly affect their scholastic performance. The implication for pre-school teachers would be to facilitate the development of a positive self-concept through an integrated approach as early as possible, thus empowering youngsters to achieve optimum development. Teachers must realise their role as a significant other in the lives of their pupils.

Gender Considerations

The data generated during this investigation was analysed to determine whether or not significant gender differences might be manifested when an expressive movement programme is used as the intervention medium.

1. The results yielded no significant differences in the development of gross motor co-ordination between five-year old boys and girls. Although a significant interaction effect occurred between the pooled experimental group and gender at the post test 1 level, boys and girls maintained a similar developmental pattern for gross motor co-ordination throughout the duration of this investigation. Both boys and girls significantly enhanced their gross motor co-ordination through participation in an expressive movement programme.

2. No significant differences were revealed between boys and girls pertaining to visual-motor integration. This finding is in support of stated literature not only pertaining to gender equality but also pertaining to exhibiting a greater variability in visual-motor integration amongst five-year old youngsters. Of great concern is the initial developmental lag observed at the onset of this investigation which has not been overcome completely at the termination of the intervention programme. This observation has implications for scholastic readiness of the youngsters. Further research on this issue within the multicultural diverse population of South Africa is deemed essential.

3. No significant differences were found for boys and girls pertaining to self-concept development. Both boys and girls revealed a significantly enhanced self-concept after

participation in an expressive movement programme revealing a similar developmental pattern throughout the duration of the study.

Recommendations for Future Study

A spectrum of potential areas in early childhood education could be identified as necessitating further research.

- The participants in the sample were limited to the Coloured community in the urban environment of Port Elizabeth in the Eastern Cape, restricting generalisation of the results to the multi-cultural educational context in South Africa. A similar study could be conducted including all cultural groups in multiple environmental contexts, considering socio-economic status as a dependent variable. Mayer (1992) found that rural children living in socially isolated environments did less well than urban children on tests relevant to role taking, but their performance in logical operations was superior. In South Africa, it seems as if rural children are prone to poor nutrition, poverty, and lack of adequate school facilities (Dawes & Donald, 1994). It is thus possible that urban areas provide a context which would lend itself to children having different developmental outcomes than rural areas would.

- Pertaining to the measurement of the developmental status of children, it is recommended to rather provide profiles of children's performance, than a composite score only.

- There is a definite need for upgrading pre-school teacher training in the area of perceptual-motor development of young children. Competent teachers should be equipped to design or implement perceptual-motor development activities for children. A need exists for providing leadership for pre-school teachers pertaining to movement education in the pre-school classroom as non-specialist teachers lack knowledge and proficiency in this field. Staff development courses, workshops, presentations at professional conferences and possibly consulting work, should be offered. A resource centre and data-bank for developing the movement education curriculum in pre-school settings should be established.

- There is evidence to show that many young qualified teachers feel inadequate and insecure in teaching dance. While an increase in dance training would help, the crucial issue is that teachers lack the conceptualisation of dance and imagination applied to dance teaching.

> To be of full value to a child's education, dance must be an integral and continuous aspect of the curriculum, from nursery school on, and not just a wet weather inclusion or reliant on the interest of a particular member of staff. To achieve this we must continue to promote dance from grass roots level...(Younger, 1989, p. 175)

- A definite need exists in pre-schoolers for sufficient time-allocation to ensure access of children to a broad range of movement activities including opportunities to participate in expressive movement which are process orientated and child-centered. Expressive movement programmes could be extended to include holiday time utilising school facilities.

- In addition to successfully integrating movement education into the pre-school curriculum, the lack of movement activity space and equipment, limits opportunities for meaningful movement experiences. It is recommended that a movement area similar to the construction of the art, dramatic play, maths and reading or writing areas, be established in every pre-school classroom or at least then the design and building of a multipurpose activity space at every pre-school.

- Currently movement education has been degraded to an insignificant level or has even become extinct as a subject in schools. It is lastly recommended that movement education be raised to a curriculum subject with a high profile. All schools should for example offer at least two hours per week of movement education in formal lessons with the possibility of a further four hours per week for those schools wanting to achieve a gold star award for quality participation and movement innovation.

Conclusion

The value of expressive movement education as an integral part of pre-school education was confirmed. However, the problems that children from disadvantaged communities may experience with their development is not only an educational one. An observation was made throughout the duration of this investigation that the parents were not interested in the progressive development of their children. The attitudes and perceptions that parents hold pertaining to the value of education and the interest they show in their children, have a vast impact on the healthy development of children. There is scope for research pertaining to the motivation and active involvement of parents in the education of their children as well as meaningful interaction and communication between teachers and parents to ensure a clarification of their role as partners in the educational process.

Appendix A

The Expressive Movement Program (Lesson Plans)

LESSON 1: BODY AWARENESS AND SPATIAL AWARENESS

A. INTRODUCTION

1. Follow the leader:

Stretch R. arm up high, to touch the sky; drop R.arm down next to your bodies;

Stretch L. arm up high, to touch the sky; drop L.arm down next to your bodies;

Stretch both arms up high; collapse down to the floor into a tiny bundle;

Inchworm (WALK HANDS FORWARD, walk feet towards hands);

Catback (round back), stretch onto tippie toes touching the sky.

Repeat 1 but facing in different directions at every attempt.

Use bells and cucumber as movement stimulus.

B. MOVEMENT EXPLORATION AND DEVELOPMENT

2. Who can show us how to:

Jump on the spot (on both legs)

Jump and bounce like a ball (shoot fingers forward, upward, sideward, downward)

Jump with feet apart (as wide as your shoulders, can you jump and move your feet further apart?)

Jump with feet like a scissors across your bodies? (Can you clap your hands when you do this; in front of your bodies?; above your heads?)

Jump and turn around like a clock?

Jump from 1 leg onto another.

3. Who can show us how to skip?

   Skipping around in a circle, forward and backwards

   Step hop and turn

   Step hop with a friend

4. Seedling growth.

   Who can tell me what this is? (A sunflower seed)

   What does it need to grow?

   Let us be seeds being planted in the soil. With rain and sunlight we grow into beautiful flowers.

   Show me your flower and turn it towards the sun.

   Use shaker as movement stimulus.

5. Show me how you can be as ...

   Tiny as a bug

   Tall as a giraffe

   Fat as a cow

   Narrow as a pencil

6. Freeze-game:

   Freeze means to stop dead on command. (Suck your tummy in, grab hold of the ground with your toes/feet).

   Let's start the game: Skip - Freeze - show me how you can be as tiny as a bug.

   -Run - Freeze - Stalk stand (balance on 1 leg, arms shape a long beak, closing 1 eye, looking for frogs to eat)

   - Make up similar movement sequences (rhino balance).

7. Draw a big circle around yourself on the floor with chalk.

   Who can tell us what shape this figure is in?

   What other things have round shapes?

   Can you draw the round shape in the air for me?

Now put your fingers in wet paint and put specks of paint all over your circle.

Now paint over the whole surface of your circle using your whole arm.

Can you draw the circle with your foot on the floor for me?

Now put your feet in wet paint and put specks of paint all over your circle.

Can you make your body into a round shape on the floor?

Can you make your body into a round shape in the air?

Can you make a round shape with a friend on the floor?

Can you make a round shape with a friend in the air?

Can you think of any other shape?

Let us draw the shape in the air.

Put specks of paint on your shape.

Paint over the shape.

Draw the shape on the floor with your big toe.

Make your body into that shape on the floor.

Make your body into that shape in the air.

Make the shape with a friend on the floor.

Make the shape with a friend in the air.

C. CLOSURE ON BODY AWARENESS.

8. Draw me the best picture of yourself.

LESSON 2: BODY AWARENESS AND FUNDAMENTAL LOCOMOTOR SKILLS

A. INTRODUCTION

1. Follow the leader:

Stretch R. arm up high, to touch the sky; drop R.arm down next to your bodies;

Stretch L. arm up high, to touch the sky; drop L.arm down next to your bodies;

Stretch both arms up high; collapse down to the floor into a tiny bundle;

Inchworm (WALK HANDS FORWARD, walk feet towards hands);

Catback (round back), stretch onto tippie toes touching the sky.

Repeat 1 but facing in different directions at every attempt.

Use bells and cucumber as movement stimulus.

B. MOVEMENT EXPLORATION AND DEVELOPMENT

2. Who can show us how to:

Jump on the spot with:

- arms hanging loosely like a rag doll's
- fingers twinkling like stars
- feet wide apart
- feet criss-crossing
- sideways with aeroplane arms
- forwards and backwards
- turning around like a clock.

3. Hops

Follow stars on floor. Hop from 1 leg to the same leg;
Hop from 1 leg to the other leg;
Hop from 1 leg onto both legs.

4. Body awareness.

Show me how you can be as ...

Tiny as a bug

Big as a house

Tall as a giraffe

Heavy as a rhino

Fat as a cow

Narrow as a pencil

Balance in stalk stand.

Balance in rhino stand.

5. Seedling growth.

Show me how you can grow as a seed being planted in the soil.

The rain falls on you and the sun shines on you and you become the most beautiful flowery plant. Show me your flowers.

Use shaker as movement stimulus.

Select 3 children to be the sun shining on the growing plants, select another 3 to be the pouring rain and another 3 to be the wind.

Repeat, but give each child a different role to paly.

Use tambourine as movement stimulus.

C. BASIC LOCOMOTOR SKILLS

6. Walk around like you walked to school this morning, without bumping into anybody.

Who can walk like an old man?

Who can walk (march) like a soldier?

Who can walk like a spider?

Who can walk like a crab?

Who can walk like a giant?

Who can walk like a fairy?

Who can walk heel to toe forward?

Who can walk heel to toe backward?

7. Skip

Following the pathway of the stars, skip by yourself.

Who can turn around while skipping?

Who can skip with a friend?

Who can skip with a friend and turn around while skipping?

8. Glide\Slide

9. Freeze game

Build movement sequences

-skip\glide\walk - FREEZE - stalk stand

- etc

10. Body awareness

Body tracing and body jump.

10.1 Find a friend.

1 lie down with face towards floor on a piece of big brown paper. The other 1 draws the outline of the friend's body onto the paper (use crayons).

Colour in the eyes, ears, hair, nose, mouths and hands and feet.

Repeat the activity with the drawing friend now lying face down.

Who can stand at the head and jump to the shoulder?

Who can stand on the shoulder and jump to the hip?

Who can stand on the hip and jump to the knee?

Who can stand on the knee and jump to the big toe?

LESSON 3: BODY AWARENESS AND SHAPES

A INTRODUCTION

1. Provide each child with 2 different shapes of leaves, drawing paper and crayons.

1.1 Cognitive involvement

- What are these?
- Where do they grow?
- What do they need to grow?
- What colour are they?
- In which ways are they alike\similar?
- In which ways are they different?

2. Visual-motor integration

2.1 Draw the 2 different type of leaves on the paper.
2.2 Draw the 2 different types of leaves in the air.
2.3 Put specks of paint all over your leaves in the air.
2.4 Use your whole arm to paint over your leaf in the air.
2.5 Draw the 2 different types of leaves on the floor with your big toe.
2.6 Put specks of paint all over your leaves on the floor.

3. Body awareness

3.1 Can you make your body into the shape of your big leaf on the floor?
3.2 Can you make your body into the shape of your big leaf in the air?
3.3 Can you make your body into the shape of your small leaf on the floor?
3.4 Can you make your body into the shape of your small leaf in the air?
3.5 Can you think of any other different shapes of leaves? (Spiky, round, star)
3.6 Draw that shape in the air.
3.7 Put specks of paint all over your leaf in the air.
3.8 Paint all over your leaf in the air.
3.9 Draw that shape of leaf on the floor with your big toe.
3.10 Put specks of paint all over your leaf on the floor.
3.11 Make your body into that shape on the floor.
3.12 Make your body into that shape in the air.

4. Movement exploration and development

4.1 Who can stretch up as high as possible (on tippie toes to touch the sky) and curl up as small/tiny as possible like a bug?
Repeat several times.
4.2 Who can stretch up as high as possible, then spread both arms (eagle wings) to the side and spin/twirl down into a curled shape?
4.3 Who can run into an open space, stretch up high, spread arms out (eagle arms) and spin/twirl down into a curled shape.
Repeat several times - vary types of shapes (spiky, star, narrow).

5. Butterflies in the sand (Use a puppet as movement stimulus).

Lie on your back on the floor. Keep your body stiff. Arms lie next to your legs, make all your body parts touch the floor. This is your neutral position. When a movement has been completed, return to this position.

5.1 Symmetrical body movements

Who can move both arms up above their heads to clasp their hands?

Return to neutral.

Who can move both ankles apart as wide as possible?

Return to neutral.

Who can bend both elbows and make a spiky shape with their hands?

Return to neutral.

Who can bend both knees and both elbows?

Return to neutral.

5.2 Unilateral and asymmetrical body movements

Who can move 1 arm up above your head and move the same leg to your side?

Return to neutral.

Who can move 1 arm diagonally up and move the opposite leg sideways?

Return to neutral.

Who can bend 1 knee and bend the opposite elbow?

6. Locomotion

6.1 Teach gross motor movement vocabulary: Rhino-walk
Spider-walk
Crab-walk
Old man walk

6.2 Make up movement sequences for the freeze game:

Skip, jump, freeze, stalk stand

Glide, spin, freeze, spiky shape

Spider walk, freeze, balance with 2 body parts touching the ground etc.

7. Conclusion: Who can draw a butterfly?

LESSON 4: LATERALITY AWARENESS AND SPATIAL DESIGN

A. INTRODUCTION:

1. Tie a ribbon around the R. Arm of each child. Get children to tie ribbon to their friends wrist.

   Reach with R. Arm high above head on tippie toes to touch the sky, and curl up as small as possible (as tiny as a bug).

   Repeat with L. Arm.

   Repeat with both arms, spread arms like eagle wings, spin around and end in an upside down shape. Vary end shapes (narrow, star, leaf, funny).

   Use tambourine as movement stimulus.

2. Lazy butterflies in the sand.

   Vary different symmetrical body positions

   - lying down
   - standing up

   Vary different asymmetrical body positions

   - lying down
   - standing up

   Specify using R. Arm, R. Leg, L. Arm, L. Leg

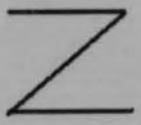
   Vary different unilateral body positions.

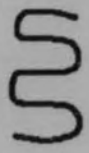
B. GROSS MOTOR MOVEMENT - MOVEMENT EXPLORATION AND DISCOVERY

3.1 Teach the locomotor skills of gliding and skating.

3.2 Teach the gallop step.

4. Draw the following pathways with chalk on the floor:
If ropes are available, let each child copy the shape using the rope on the floor.



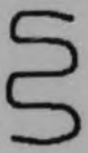


4.1 Can you draw the shapes in the air using your whole body?

4.2 Walk stealthily like a cat through the

4.3 Walk backwards through the

4.4 Walk sideways, criss-crossing legs through the



4.5 Jump from 1 dot to another. (1 foot to 1 foot, 1 foot to another foot, 1 foot to 2 feet, 2 feet to 2 feet, 2 feet to 1 foot).

4.6 Who can make their bodies into the different shapes? Specify shape at a time on the floor; in the air?

4.7 Who can make the different shapes together with a friend (using their bodies on the floor; in the air? Specify 1 shape at a time).

4.8 Provide each child with a ribbon. Copy the different shapes with your ribbon in the air.

5. CLOSURE:

5.1 Who can combine making different shapes with the ribbon with gross motor movement eg. Skipping, gliding, running and galloping, walking backwards, sidewards etc?

5.2 Who can draw the different shapes on a piece of paper?

LESSON 5: SPATIAL DESIGN

A. INTRODUCTION

1. Spread different coloured ribbons out in available floor space. Let the children enter the class and sit at a ribbon of their own choice.

1.1 Follow the leader. Start in the sitting position and do different stretches. Repeat stretches in the kneeling position. Progress to stretches in the standing position (plie, lunges, body circles, aeroplane arms. (Use the ribbon throughout).

1.2 Reach up high onto tippie toes, hold ribbon between both hands and scrunch\curl up to be as tiny as a bug.

1.3 Reach up high onto tippie toes, spread arms like eagle wings, twirl and freeze in stalk stand.

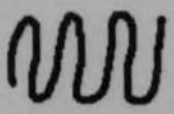
Continue using similar movement sequences.

B. AXIAL MOVEMENT: NON-LOCOMOTOR

2. Copy the following figures in the air with your ribbon:

circle

snake\wave



zig-zag

rainbow

upside down rainbow

spiral

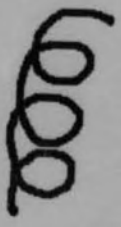
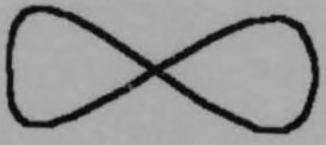


figure of eight



C. GROSS-MOTOR MOVEMENT: COMBINING LOCOMOTOR SKILLS AND SHAPES

3. Who can skip and circle their ribbons at the same time?
Who can turn and snake their ribbons simultaneously?
Who can glide and zig-zag?
Who can run backwards and spiral their ribbons simultaneously?
Who can run, run and leap and make a figure of 8 with their ribbons simultaneously?
Who can gallop and make a rainbow simultaneously?
Who can sway and make an upside down rainbow simultaneously?

4. Make up a specific movement sequence:
Swing and step to the right;
Swing and step to the left
Repeat X 4 times
Step together step sideways and circle the ribbon and balance sideways, reaching diagonally up with R. Arm, lifting L.leg sideways, repeat to the other side.
Use cue words : Swing X 5, step together step and hold.

5. Put ribbon down on the floor. Stand at 1 end and jump to the opposite end.
Repeat, but find a different jump to get to the other side. Who can think of any other way of getting to the other end of the ribbon?

6. Find a friend with the same colour ribbon as you.
Mirror each other and make 3 different shapes each using their own ribbons.
Who can make 2 different shapes together as friends?

7. Make up a circle dance with the ribbon.
Make groups of 4. Hold onto each others ribbon.

7.1 Lift your ribbons up high standing on your tippie toes.

7.2 Make your circle wide and big (ribbons held shoulder height).

7.3 Make your circle as small as possible, then spread it out as wide as possible.

7.4 Walk forward and in for 2 steps, walk backward and out for 2 steps. Glide around in the circle for 4 steps.

7.5 Twirl around by yourself and end in a twisted shape.

LESSON 6: OBJECT BALANCE AND MANIPULATIVE EXPLORATION

A. INTRODUCTION

1. Spread rolled up socks all over the floor surface. Let children enter the class by sitting at a pair of socks of their choice.

B. MOVEMENT EXPLORATION AND DISCOVERY

2. Static balance and object balance

2.1 Who can show us how to balance the pair of socks on your head?

2.2 Who can show us how to balance the pair of socks on your head in stalk stand position. Vary stalk stand by taking balancing leg to the back of the body.

Who can show us how to balance the pair of socks on any other body part ?

Who can show us an upside down shape, balancing the socks on any body part?

Who can show us any other shape balancing the socks on any body part?

3 Dynamic balance.

Who can walk forwards X 3 steps and curtsy balancing the socks on your heads?

Who can walk backwards X 3 steps and bow balancing the socks on your heads?

Who can move in any other way and balance the socks on any body part?

4. Exploring manipulative skills

Who can toss the socks into the air and catch it:

- in the sitting position?
- in the kneeling position?
- standing?
- standing on 1 leg?

- standing on 1 leg with 1 eye closed?

5. Combining locomotor and manipulative skills

Who can toss the socks into the air, twirl around and catch it?

Who can run, toss the socks into the air, jump and catch it?

Who can gallop, toss the socks into the air and catch it?

Who can move in any other possible way, tossing and catching the socks?

6. Partner work: find a friend.

Sit wide-legged with soles of the feet touching, alternatively roll and toss the socks to 1 another. Together with your friend, who can make a star shape, balancing the socks on any body part?

Who can make any other shape with your friend, balancing the socks on any body part.

7. Make up movement sequences, playing the Freeze Game.

- Toss, catch, twirl, freeze, end in a twisted shape, balancing the socks on any body part.
- Roll the socks, catch it, freeze in an upside down position.
- Run, leap, twirl, collapse, freeze, balance on 1 hand and 1 foot.

LESSON 7: GROSS MOTOR COORDINATION

A. INTRODUCTION

1. Who can copy 1 hand and 1 foot onto the piece of paper provided? Can you cut it out with scissors (to make a hand and footpath to be used later on)

2. Exploring gross motor coordination skills.

Draw a coordination ladder with chalk on the floor (use masking tape if available)

Who can walk hand-hand, foot-foot across the ladder?

Who can walk sideways across (ster sideways and step together)?

Who can walk sideways across (step sideways and cross leg in front of supporting leg; alternate crossing in front of and crossing at the back of)?

Who can bunny hop across the ladder?

Who can do stepping stones across (use different hops)?

Who can crab walk across?

Who can find any other way to get across?

3. Teach locomotive skill of rolling

Teach them the log roll and the egg roll. For the log roll, have the children extend their arms above their heads with extended legs. Roll over, head first, then arms, followed by the hips and legs. Explore rolling from their backs to their tummies and vice versa.

For the egg roll let the children lie down on their backs, fold their arms over their knees and hold their knees close to their chest. Squeezing their bodies up as tight and round as possible, like a ball. Challenge them to roll over in different directions while maintaining a round body shape. Who can find any other way of rolling?

4. Stepping Stones.

4.1 Who can find a way of jumping into the blocks without stepping into the blocks with stones in?

5. Provide each child with a T-shirt.

Who can toss their shirt into the air and catch it with different body parts?

Can you have a friend sit on your shirt and spin him/her around?

Can you make a shape with both T-shirts and keep it stretched out?

Can you make your bodies into a similar shape?

6. Concluding activity

Who can draw the coördination ladder?

LESSON 8: SPATIAL DESIGNS AND GROUP WORK

A. INTRODUCTION

1. Can you find a star on the floor and lie on it on your back? Put your R. Hand on your chest and listen to your heart beat.

Who can click the sound with your tongue?
Who can say the sound out loudly?
Who can put the sound in your fingers?
Who can clap the sound out?
Who can put the beat of your heart into your feet?
Who can walk the beat out?
Who can draw the heart shape in the air?
Who can make your body into a heart shape (on the floor and in the air)?
Who can make a heart shape with a friend?

2. Create movement sequences (run, leap, gallop, skip slide, egg roll, log roll) and freeze in a heart shape.

3. Exploring movement challenges

3.1 Show the children a brick and discuss its properties and functions.

3.2 We are going to build bridges with our bodies. Remember there must be enough space available for someone to pass underneath it.

Who can find a way of building a bridge with your body? Now who can find 2 different ways of building a bridge with their bodies?

3.3 Partner work.

Who can build a bridge together with the body of a friend?
Who can find 2 other ways of building a bridge with a friend.

3.4 Form groups of 5 each.

Who can make a chain bridge, standing wide-legged, holding hands. The first child in the row crawls underneath the second child's legs and continues

underneath the arms of the second and third child's arms. Continue through the chain to the end of the row, joining the chain at the rear again.

4. Play a rhythm game. Create a sequence of body sounds for the children to imitate. Let them create their own rhythmic sequences of at least 3 different sounds.

5. Create movement sequences to accompany the rhythmic sequences as choreographed by the children.

6. Conclusion: end off by drawing a bridge and a heart.

Who can draw a chain bridge?

LESSON 9: SPATIAL AWARENESS AND MOVEMENT QUALITIES

A. INTRODUCTION

1.1 How do we know that a new day has started?

The sun rises in the east across the horizon, shining all the while across the sky to set in the west, until it is no longer in sight. It takes from early morning to early evening for the sun to move from the east to the west. (Make a drawing/picture of the rising and setting sun and prestik it onto the easterly and westerly wall).

1.2 Who can show me how the sun rises in the early morning in the east?

1.3 Who can travel across the sky towards the west and freeze in the middle of the way in a sunshine position?

1.4 Who can let their sun set in the west?

1.5 What other elements of nature do we find in the sky?

- CLOUDS - how many different types of clouds have you seen before?
- have you ever sat looking up into the sky, watching the clouds forming the shapes of animals or things/objects?

1.6 Who can make the shape of A big fluffy cloud?
A dark stormy cloud?
A drifting cloud?

1.7 Who can change from a big fluffy cloud to a dark stormy cloud and to a drifting cloud on the different sounds that I play?

1.8 Who can make a cloud shape with a friend and then change to another cloud shape?

1.9 Who can make a cloud shape with 3 people in the cloud?

2. Thunderstorm and pouring rain

Lightning is the flash of light caused by a discharge of electricity from 1 cloud to another \ from a cloud to the earth. Can you show me what it looks like?

Thunder is the sound that follows the lightning and is caused by the expansion of air due to the electrical discharge. Can you show me what it looks like?

Remind the children that flashes of lightning and rumbles of thunder can vary in intensity. Similarly the number of seconds that pass between a flash of lightning and the rumble of thunder can also vary.

Take partners and decide who is to be the thunder and who the lightning. At a signal the partner separates and begins moving about the room. The partner acting as lightning can choose any moment to strike. The partner acting as thunder must then respond, moving in a way depicting thunder. Reverse active participation. Use tambourine/cucumber as movement stimulus.

3.1 There are other directions than east and west.

SOUTH - where the birds migrate or move to in summer.

NORTH -where the Eskimo's live in Iceland.

Put appropriate pictures on the southern and northern wall.

3.2 Who can move towards the south and freeze in stork stand?

3.3 Who can move towards the north and freeze in an upside down shape?

3.4 Who can move towards the east and freeze in a sunrise shape?

3.5 Who can move across the sky to the west and freeze in the sunset position?

4. CONCLUSION: Draw the sunrise/sunset, drifting clouds and thunderstorm.

LESSON 10: GROUP WORK AND CO-OPERATION

A. INTRODUCTION

1. MOVEMENT DEVELOPMENT

1.1 Spread duvet covers open all over the floor space. Children use gross movement steps to move around it (Skip, gallop, leap, run, roll and spin/twirl).

1.2 Create movement sequences and freeze in a balancing position reaching and holding a balance position towards the duvet.

1.3 Create movement sequences and freeze on top of the duvet in a round shape.

1.4 Create movement sequences and freeze underneath the duvet in a tiny shape.

1.5 Together make an animal shape, star shape and a flat shape underneath the duvet.

2. Spread the duvet out on the floor and stand at a corner (Four children per duvet).

2.1 Who can log roll across to the other side?

2.2 Who can egg roll across to the other side?

2.3 Who can move in any other way across to the other side?

3.1 Stand at the corner of the duvet. Who can make the duvet breathe gently lifting it and lowering it rhythmically?

3.2 Can you hold the duvet hip height and give two steps inwards, take two steps outwards and lift the duvet high into the air, on tiptoes?

3.3 Can you walk around in circular direction holding on to the corners of the duvet?

3.4 Can you walk around in circular direction holding on to the corners of the duvet, with the backs facing the duvet?

3.5 Can you spin and tumble around like washing in a washing machine holding onto the duvet?

3.6 Holding on to the duvet, jump in and out, double feet and then on one leg only.

4. Duvet Game. Six children per duvet. Hold on to the corners of the duvet and make it breathe. Take turns to cross underneath the duvet in any way. Then freeze in any special shape.

CONCLUDING: Design a duvet dance incorporating activities of 3.1-3.5.

LESSON 11: A VISIT TO A TROPICAL ISLAND

A. INTRODUCTION

1. Sailing to and exploring a tropical island. (Have a map available of the sailing ship and the tropical island.)

1.1 Determine the direction of the wind. Recap on east, south, west and north. Write the first letter of each of the wind directions in the air. Repeat, writing it with the foot on the floor.

1.2 Hoist the sails and sail in a northern direction and freeze. Change direction to the west and freeze in a sunset position. Repeat the activity to the south and the east.

1.3 Reaching the island, together with a friend build two different types of bridges to reach the shore.

1.4 Dry the sails by playing lazy butterflies in the sand. (Symmetrical, asymmetrical and uni-lateral movement).

1.5 Follow the footpaths across the mountain bending down low as you walk through dense bush. Vary movements:

- dinosaur walk (homolateral)
- bunny hop
- gallop
- cross-lateral creeping and crawling
- busy spiders
- Mr turtle

1.6 Who can jump across the river from stone to stone using different jumps?

1.7 Reaching the enchanted forest sit on a mushroom, close your eyes and listen to the island sounds. What do you hear?

1.8 Can you hear the bush folk sending messages to each other saying that we are invading their island? Listen carefully and let's send messages back to them saying that we are just friendly visitors.

1.9 Can you see the moon and stars appear in the sky, telling us it is time to return home? Can you hop onto the magic carpet, freeze in a star or moon shape before we continue on our journey home?

2. CONCLUSION: Who can draw the island?

LESSON 12: MANIPULATIVE SKILLS

A. INTRODUCTION

1. Spread balloons all over the floor surface. Each child enters class by sitting at a balloon.

1.1 Who can toss the balloon into the air and catch it again?
Who can toss the balloon into the air and catch it again while sitting/kneeling/standing?

1.2 Who can toss the balloon into the air, spin around and catch it?

1.3 Who can balance in stalk stand with the balloon on your head?

1.4 Who can show me any other balancing position with the balloon balanced on any body part?

B. MOVEMENT EXPLORATION AND DEVELOPMENT

2. Who can blow up their balloons and let me tie a knot in it?

2.1 Who can keep their balloons in the air without letting it touch the floor or anybody else?

Who can do this standing/ kneeling/sitting/balancing on 1 leg?

3. Find a friend with the same colour balloon as you.

3.1 Who can make a balloon shape with a friend, using your bodies?

3.2 Who can make up a shape with your friend in a balancing position using your balloons.

3.3 Stand opposite each other. Put 1 balloon down, can you gently toss the balloon to each other in the air. Can you do this while standing/sitting wide-legged apart?

4. Tie a string to your balloon.

4.1 Follow the leader.

Do different stretches and balances.

-Stretch high on tippie toes, balloon over head.

3. Stepping Stones.

3.1 Who can find a way of jumping into the blocks without stepping into the blocks with stones in?

-Stretch sideward, balancing on 1 leg.

-Stretch with balloon between feet up high.

4.2 Explore repertoire of gross motor movement vocabulary (skip, glide, gallop, run, leap) with balloon.

4.3 Discover swaying and swinging the balloon

-forwards and backwards

-sideways

-horizontally above the head.

5. Design a balloon dance

Swing sideways X 4, step together step, balance.

Repeat.

Step forward, swing balloon horizontally above head X 4.

Twirl around and FREEZE in an upside down shape.

6. The children taught me the balloon song while running around in a circle.

LESSON 13 AND 14: CONSOLIDATION

An overview of the repertoire of movement vocabulary previously learned and expressed in terms of expressive movement. A compilation of all components of movement awareness and fundamental motor skills acquired.

Appendix B

Consent Form

January 1996

Dear Parent

I herewith request your permission for your child, currently enrolled in the pre-primary class at _____ _____primary school to participate in an expressive movement program for a duration of seven weeks. The program will be presented twice a week for a period of 25 minutes during class time. There will be no financial implication for participating. The researcher intends to facilitate the perceptual-motor development of your child through program participation. Perceptual-motor development is a prerequisite to school readiness and plays a roll in academic success.

The research information will be handled as confidential and will contribute towards the completion of a doctoral dissertation.

Kindly supply us with permission for your child's participation in this program by signing this letter of consent.

Please return this letter to the school at your earliest convenience.

Thanking you in anticipation.

Kind regards

_____

The Researcher

Appendix C

The Charlop-Atwell Scale of Gross Motor Co-ordination

Each child was tested individually in the company of only the rater. Total scale administration and scoring time is approximately 15 minutes per child. Each child received a standard set of instructions and a demonstration for each item. For convenience during the testing situation, the instructions for each item are provided along with the testing criteria on the scale scoring sheets. The children were tested barefeet.

In order to attain optimal performance, the rater established and maintained good rapport with each child during the administration of the scale. It is recommended that raters engage the child in a brief conversation before testing to make the child feel more relaxed and comfortable. It is also desirable for the testers to reinforce the child with praise and offer encouragement throughout the testing procedure. If a child obviously did not understand the instruction, instructions were repeated without penalizing the child's score.

For the scale item Scarf Twirl, the child was permitted to hold the scarf in which-ever hand was preferred. The child was also allowed to hop on either the right or left foot for the Hopping item.

For the two items, Tiptoe Balance and Hopping on one foot, in which scoring is based on a time criterion, a stop watch was used. For the scale item Scarf Twirl, a handkerchief was used.

The order in which the items are presented is not predetermined. During the provisional standardization procedure, the items were administered in a random order. It is advisable to start the testing procedure with an easier item to allow the child to initially experience success.

For the purpose of this investigation the following order of items was presented, namely :

1. Tiptoe Balance
2. Hopping on one foot
3. Jump and about face
4. Jumping Jacks
5. Prehistoric Animal and
6. Scarf Twirl.

Upon completion of the testing, the child was thanked for his/her cooperation and performance.

NAME_____ Objective subtest /38

AGE_____ Subjective subtest /34

DATE_____ Total Scale Score /72

1. TIPTOE BALANCE

Instructions:

I want you to stand on your toes without moving around or putting your heels down, until I tell you to stop. (Demonstrator stands on toes for 8 seconds.) Now you try it. (Demonstrator tells the child to stop after 8 seconds.

Objective criteria
6pt. Balances for 8 sec., without putting heels down
4pt. Balances for 8 sec., putting heels down after 4 seconds
2pt. Puts heels down within 4 sec
0pt. Quits before 8 sec.

Subjective criteria
Precision of movement
2pt. Stands in one place without moving feet
1pt. Moves feet after 4 seconds
0pt. Moves feet within first 4 seconds

Smoothness and flow
2 pt. Exhibits no wobbling of any part of the body while balancing
1pt. Exhibits wobbling after 4 seconds of balancing
0 pt Exhibits wobbling within first 4 seconds

Flexibility
2 pt Child quickly and easily gets on tiptoes on first attempt
1 pt Child takes two attempts to get on tiptoes before balancing begins
0 pt Child needs extra instruction on how to stand on tiptoes

2. HOPPING ON ONE FOOT

Instructions:

I want you to hop in place on one foot until I tell you to stop. (Demonstrator hops in place for 8 seconds.) Remember to keep hopping, without putting your other foot down, until I tell you to stop. Try to hop in one place, don't hop around the room. Ready? Start hopping. (Demonstrator tells the child to stop after 8 seconds).

Objective criteria
6pt. Hops in place for 8 sec., without putting raised foot down
4pt. Hops in place for 8 sec., with putting foot down only once after 4 seconds
2pt. Puts foot down within first 4 sec
0pt. Quits before 8 sec.

Subjective criteria
Precision of movement
2pt. Hops relatively in one place without moving about
1pt. Hops within area of one square foot
0pt. Hops without staying in area of one square foot

Smoothness and flow
2 pt. Continuous hopping
1pt. Slight pauses between hops or unclear about pauses
0 pt Long pauses between hops

Flexibility
2 pt Lands lightly on ground
1 pt Unclear or lands moderately heavily on ground
0 pt Lands heavily on ground

3. JUMP AND ABOUT FACE

Instructions:

I want you to jump into the air, turning around so that you face the wall behind you, and land with both feet on the ground. Watch me. (Demonstrator jumps into the air turning 180degrees to face the opposite direction and lands with both feet touching the ground at the same time.) Now you try it.

Objective criteria
4pt. Jumps and lands directly facing opposite direction
2pt. Jumps but does not land directly facing opposite direction
0pt. Failure to turn opposite direction when jumping

Subjective criteria
Precision of movement
2pt. Appears to land with both feet touching the ground at the same time
1pt. Lands with one foot obviously reaching the ground first, then followed by the other foot
0pt. Steps back or falls when landing

Flexibility
2 pt Arms relaxed
1 pt Arms stiff and rigid
0 pt Arms moved first before the body turns

4. JUMPING JACKS

Instructions:

We are going to do jumping jacks. Watch me first. You are to jump, putting your feet apart and your arms up so that you can clap your hands above your head like this. Now, you're to jump putting your feet back together and your arms back down at your side like this. Now you're back where you started from. Watch me again. Jump so that your feet are apart and your hands clap above your head. Then you're going to jump back to how you were before with your feet together and your arms down at your side. So it's, arms up, legs out; then arms down and feet back together. (Demonstrator is to perform the movements as she explains what the child is to do). Now you try it: Arms up, feet apart. Now, arms back, feet together. (Demonstrator has the child do this a few times.) Now I want you to do the jumping jacks faster by yourself like this. (Demonstrator does three continuous jumping jacks in a row.) Now you try it. (If child cannot perform at least one correct jumping jack, repeat instructions and have the child try again. Allow the child three trials before moving on to the next scale item.)

Objective criteria 1 trial = 5 seconds
6pt. Does one jumping jack on first trial
4pt. Does one jumping jack on second trial
2 pt Does at least one jumping jack on third trial

Subjective criteria
Precision of movement
2pt. Arms raised and lowered and legs moved out and back together not necessarily in synchrony
1pt. Arms raised and lowered or legs moved out and back together
0pt. Failure to do no 1 and no 2

Smoothness and flow
2pt Continuous movement
1pt Slight pauses between jumping jacks
0pt Stops before each jumping jack to return to starting position, then proceeds.

Flexibility
2 pt Agile and bendable, not stiff and rigid, arms relaxed
1 pt Exhibition of tense and strained movements
0 pt Jerky, robot-like movements

5. PREHISTORIC ANIMAL

Instructions:

I want you to get down on your hands and feet like this. (Demonstrator has both hands and feet on the ground with knees extended straight). Don't bend your knees. Now, take 1 step forward with one hand, not moving your other hand and feet (demonstrate). Then move the other hand forward, then 1 foot, then the other foot. (Demonstrate). Only move what I tell

you to move. When I say hand, only move one hand. Now you try it. Get down on all fours. Remember to keep your knees straight. Now move 1 hand, then the other, then one foot, then the other foot.

hand-hand-foot-foot
hand-hand-foot-foot
(If child cannot do at least one of these series, have him/her stand up and repeat demonstration. If child still cannot perform one series correctly, score accordingly and move on to next scale item.)

Objective criteria
10pt. Alternates hand-hand, foot-foot (at least twice) on first trial of 5ft distance to be walked
8pt. Alternates hand-hand, foot-foot on first trial at least once
6pt Alternates hand-hand, foot-foot on second trial at least twice
4pt Alternates hand-hand, foot-foot once on second trial
2pt Shows some indication and attempts to move in sequence
0pt Cannot alternate hand-hand, foot-foot on any trial or crawls

Subjective criteria
Precision of movement
2pt. Does not bend legs at the knees
1pt. Bends knees some of the time
0pt. Bends at the knees while walking

Smoothness and flow
2 pt. None or slight pauses in between hand-hand, foot-foot sequences
1pt. Long pauses of three seconds or more in between hand-hand, foot-foot sequences
0 pt Falls in between or during sequences of hand-hand, foot-foot

Flexibility
2 pt Child gets into position of all fours with legs straight quickly and easily
1 pt Relatively easy for child to get into position of all fours
0 pt Difficult for child to get into position of all fours

6. SCARF TWIRL

Instructions:

I want you to take the handkerchief in your hand and hold that arm straight out from your side like this. (Demonstrator holds arm with handkerchief straight out perpendicular to body.) While you're holding your arm out, I want you to twirl across the room to where I am standing, like this. (Demonstrator twirls across a distance of 12 ft. toward the child, keeping the arm with the scarf out from her side.) Remember to keep your arm up- don't let the scarf touch the ground. While you are twirling, whenever you face me, make sure you look into my eyes. That way you won't get dizzy. (Demonstrator now stands 12 ft away from the child.) Hold your arm with the scarf straight out from your side. Now twirl on over to where I'm standing. (During the twirling, across, if the child lowers his/her arm, remind him/her to

keep his/her arm up. Also, remind the child to look into your eyes whenever possible.) Draw a diagonal line of 12 ft long across the floor space.

Objective criteria

6pt Does not drop arm and twirls in a moderately straight line (doesn't wander out of 4 ft wide area of drawn straight line between child and observer)
4pt Drops arm once and twirls on moderately straight line
2pt Drops arm more than once but twirls on moderately straight line
0pt Drops arm more than once and/or can't twirl in a straight line

Subjective criteria

Precision of movement
1pt. Does not twirl in complete circles
0pt. Failure to twirl

Smoothness and flow

2 pt. Not stopping between twirls
1pt. Stopping between twirls
0 pt Walking between twirls

Flexibility

2 pt While twirling, child shows very graceful movements, not stiff and rigid
1 pt Child exhibits some tense and strained movements while twirling
0pt Ungraceful, rigid movements while twirling

Appendix D

The Beery Developmental Test of Visual Motor Integration

The following are recommended steps for group screening

1. The children should each have a number 2 pencil without an eraser.
2. Distribute the test booklets. As you distribute them, say: please wait to begin until you are asked to do so. Do not open your test booklets until I ask you to open them.
3. After the test booklets are distributed, say: The forms are to be copied in order. Only one try on each form is allowed.
4. As you demonstrate, say: Now open your booklets by turning from the top, like this.
5. It is important that the test booklets and each child's body be *centred* and *squared* with the desks throughout testing. As you demonstrate, say: Does everyone have his or her booklet open correctly? This is the way the booklets must stay on your desks until you are finished. This is the way you should sit.
6. Give a demonstration of form copying at the chalkboard. In your demonstration, use one or more forms of your own design, say: You are to copy what you see at the top of the page. Make your drawing of each shape in the space below it.
7. Say: Some of the forms may be hard for you to copy, but please try to copy each one of them. Just do the best you can without erasing.
8. Say: Are there any questions? Always do your own work. You may begin.
9. The name of each subject has been pre-written on the test booklet by the psychometrist.

For each form of the VMI assessment battery, there is a page of scoring information entitled Scoring Criteria in the test manual. Each of these pages give the age norm and the requirements for passing a form. To determine the VMI age equivalent for a child, add the number of forms passed up to three consecutive failures. This total is the child's raw score. For instance, if a child passed the first ten forms, failed the next three forms, and then passed the next one, his or her raw score would be only 10. Refer to the table on page 93 of the manual to find the age equivalent that corresponds with the child's raw score. Percentile and standard score equivalents of raw scores for various ages are available in the manual.

The recommended procedure in using the Scoring Criteria is to evaluate a child's reproduction of a form according to each of the criteria named, using the passing and failing illustrations as aids in doubtful cases. Numbers in parentheses accompanying the failing illustrations refer to the criteria listed at the top of the page. All passing and failing examples are actual reproductions that children have made. If there is any doubt whether a form should be marked "passed" or "failed" after the criteria have been studied, mark it as "passed".

Some children who are unable to copy the forms respond to many of them with indiscriminate circular marks. If such a mark is made for Form 3 (circle), this should not be scored as passing, as it is a random response and does not reflect an attempt to copy the circle.

Appendix E

The Primary and Pre-school Self-concept Scale

I want you to tell me what you are like most of the time.
After successfully completing the training exercise, the subject completed the self-concept measure, rating the concept ME using the seven adjective scales of the PPSC.

The following training exercise precedes the administration of the self concept rating. This requires subjects to rate the concepts MILK and SOUP along the bipolar continuum hot-cold using the two step questioning procedure i.e.:

1. "Most of the time is MILK hot or cold?"

   The subjects response is followed with a second question:

2. "Most of the time is MILK very cold (hot) or a little bit cold (hot)?

   Repeat with SOUP. Make sure child understands these concepts.

SCALE ITEMS

1. GOOD/BAD
   (a) "Most of the time are you GOOD or most of the time are you BAD?"
   (b) "Most of the time are you very GOOD (BAD) or just a little bit GOOD (BAD)?"

2. HAPPY/SAD
   (a) "Most of the time are you HAPPY or most of the time are you SAD?"
   (b) "Most of the time are you very HAPPY (SAD) or just a little bit HAPPY (SAD)?"

3. STRONG/WEAK
   (a) "Most of the time are you STRONG or most of the time are you WEAK?"
   (b) "Most of the time are you very STRONG (WEAK) or just a little bit STRONG (WEAK)?"

4. BIG/SMALL
   (a) "Most of the time are you BIG or most of the time are you SMALL?"
   (b) "Most of the time are you very BIG (SMALL) or just a little bit BIG (SMALL)?"

5. ACCEPTED/REJECTED
   (a) "Most of the time are you LIKED BY OTHER PEOPLE or most of the time are you NOT LIKED BY OTHER PEOPLE?"
   (b) "Most of the time are you LIKED BY OTHER PEOPLE (NOT LIKED BY OTHER PEOPLE) very much or just a little bit.

6. ACTIVE/PASSIVE
   (a) "Most of the time are you BUSY DOING SOMETHING or most of the time are you DOING NOTHING?"
   (b) "Most of the time are you very BUSY DOING SOMETHING (DOING NOTHING) or just a little bit

7. FAST/SLOW
   (a) "Most of the time are you FAST or most of the time are you SLOW?"
   (b) "Most of the time are you very FAST (SLOW) or most of the time just a little bit FAST (SLOW)?

All of the above-mentioned scale item questions are accompanied by a semantic differential bipolar picture from which the participant selects the most appropriate one.

PPSC SCORING METHODS

1. STAGER AND YOUNG SCORING METHOD FOR THE PPSC (1982)

The PPSC Score is computed by summing the participants score on each of the seven scales, where the most positive rating equalled 4 points, the least positive, 1 point. This scale does not accommodate participants who are uncertain of the intensity of the direction of a selected adjective.

2. VAN ZIJL SCORING METHOD FOR THE PPSC (1985)

The PPSC Sore is computed by summing the participant's score on each of the seven scales, where the most positive rating equalled 1 point, the least positive, 5 points participants who were uncertain of indicating the intensity of the direction of a selected adjective, equalled a score of 3.

3. PROPOSED METHOD OF SCORING FOR THE PPSC

A diagram reflecting the scoring method for the PPSC as proposed by this investigation to ensure differentiation between participants who were uncertain of the intensity of the direction (positive/negative) of a selected adjective, is represented in the following table:

POSITIVE ADJECTIVE			NEGATIVE ADJECTIVE		
VERY	UNSURE	A LITTLE	A LITTLE	UNSURE	VERY
6	5	4	3	2	1

References

Allan, M.M. (1992). The performance of South African normal pre-school children on the Griffiths Scales of mental development: A comparative study. Unpublished doctoral dissertation, University of Port Elizabeth.

Arnheim, D.D. & Pestolesi, R.A. (1973). *Developing Motor Behaviour in Children.* St Louis: Mosby.

Avery, M. (1994). Preschool physical education: A practical approach. *Journal of Physical Education, Recreation and Dance*, August, 31-39.

Ayres, A.J. (1972). Improving academic scores through sensory integration. *Journal of Learning Disabilities*, 1972, 5, 24-28.

Ayres, A.J. (1972). *Sensory integration and Learning disorders.* Los Angeles: Western Psychological Services.

Bairstow, P.J. & Laszlo, J.I. (1981). Kinaesthetic sensitivity to passive movements and its relationship to motor development and motor control. *Development Medicine and Child Neurology*, 23, 506-516.

Barlow, B. (1971). Perceptual-motor activities in the treatment of severe reading disability. *The Reading Teacher*, 24, 523-525.

Barsch, R.H. (1965). *A movigenic curriculum.* Wisconsin: Bureau for handicapped children.

Barsch, R.H. (1965). *Achieving perceptual motor efficiency.* Seattle: Special Child Publications.

Barsch, R.H. (1965). *Enriching perception and cognition techniques for teachers.* Washington: Special Child Publications.

Bee, H. (1989). *The Developing Child.* New York: Harper & Row Publishers.

Beery, K.E. (1967). *Development test of visual-motor integration.* Chicago: Follett Educational Corporation.

Beery, K.E. (1982). *Revised administration, scoring and teaching manual for the development test of visual-motor integration.* Cleveland: Modern Curriculum.

Beery, K.E. & Buktenica, N.A. (1967). *Developmental test of visual-motor integration.* Chicago: Follett.

Bender, L. (1938). *A visual-motor gestalt test and its clinical use.* New York: American Orthopsychiatric Association.

Berreuta-Clement, J.R., Schweinhart, L.J., Barnett, W.S., Epstein, A.S. & Weikart, D.P. (1884). Changed lives: The effects of the Perry preschool program on youths through age 19. *Monographs of the High / Scope Educational Research Foundation*, 8. Ypsilanti, Michigan: High / Scope Press.

Bigge, M.L. & Shermis, S.S. (1992). *Learning theories for teachers*. New York: Harper Collins.

Bloom, B.S. (1956). *Taxonomy of Educational Objectives: Handbook I: Cognitive Domain*. New York: McKay.

Boucher, A. (1988). Good beginnings. *Journal of Physical Education, Recreation and Dance*, September 59 (7), 452.

Bredekamp, S. (1987). *Developmentally appropriate practice in early childhood programs serving children from birth through age 8*. Washington D.C.: National Association for Education of Young Children.

Brenner, M.W. & Gillman, S. (1966). Visuomotor ability in school children - a survey. *Developmental Medicine and Child Neurology*, 8, 686-703.

Bridgeman, Brent and Shipman V.C. (1978). Preschool measures of self-esteem and achievement motivation as predictors of third-grade achievement. *Journal of Educational Psychology*, 70(1), 17-28.

Brown, R.D., Jr. & Kenyon, G.S. (1968). *Classical Studies in Physical activity*. Englewood Clifs, NJ: Prentice-Hall.

Brown, M.B., Engelman, L. & Jenrich, R.I. (1990). *BMDP Statistial Software Manual*. University of California Press. Berkeley Los Angeles.

Bruininks, R.H. (1978). *Bruininks - Oseretsky test of motor proficiency. Examiner's manual*. Circle Pines, Minnesota: American Guidance Service.

Bruininks, R.H. (1978). *Bruininks - Oseretsky test of motor proficiency*. Circle Pines, American Guidance Service.

Butt, K.L. & Pahnos, M.L. (1995). Why we need a multicultural focus in our schools. *Journal of Physical Education, Recreation and Dance*, January, 48-53.

Byrne, B.M. (1984). The general/academic self-concept Nomological Network: A review of Construct Validation Research. *Review of Educational Research*, Fall, 54(3), 427-456.

Cantell, M.H., Smyth, M.M., & Ahonen, T.P. (1994). Clumsiness in adolescence: Educational, motor and social outcomes of motor delay detected at 5 years. *Adapted Physical Activity Quarterly*, 11, 115-129.

Caplan, F. & Caplan, T. (1973). *The power of play*. Garden City. New York: Anchor Press.

Charlop, M. & Atwell, C.W. (1980). The Charlop-Atwell scale of motor co-ordination: a quick and easy assessment of young children. *Perceptual and Motor Skills*, 50 (June), 1291-1308.

Chesson, R., McKay, L. & Stephenson, E. (1991). The consequences of motor / learning difficulties for schoolage children and their teachers: Sooner Parental Views. *Support for Learning*, 6, 173-177.

Christensen, L.B. (1997). *Experimental Methodology* (7th Edn). Boston: Allyn & Bacon.

Cicirelli, V.G., Granger, R., Schemmel, D., Cooper, W., Helms, D., Holthouse, N. & Nehls, J. (1971). Measures of self-concept, attitudes and achievement motivation of primary grade children. *Journal of School Psychology*, 9 (4), 383-391.

Clark, K.B. (1965). *Dark ghetto*. New York: Harper & Row.

Cleland, F. (1990). How many ways can I? Problem-solving through movement. In W.J. Stinson (Ed.), *Moving and Learning for the Young Child*, (pp. 73-75).

Clement, J., Schweinhart, L.J., Barnett, W.S., Epstein, A.S. & Weikart, D.P. (1984). *Changed lives: The effects of the Perry Preschool program on youths through age 19*. YPSI LANTI, MI: High/Scope Educational Research Foundation.

Cobb, P.R., Chissom, B.S., & Davis, M.W. (1975). Relationships among perceptual-motor, self-concept, and academic measures for children in kindergarten, grades one and two. *Perceptual and Motor Skills*, 41(2), 539-546.

Combs, A.W., Avila, D., & Purkey, W. (1971). *Helping Relationships: Basic Concepts for the Helping Professions*. Boston: Allyn & Bacon.

Connolly, K.J. (1984). The assessment of motor performance in children. In J. Brozek & B. Schurch (Eds.), *Malnutrition and Behaviour: critical assessment of key issues*, (pp. 230-259). Lausanne, Switzerland: Nestle Foundation.

Cook, T.D.& Campbell, D.T. (1979). *Quasi-experimentation: Design and analysis issues for field settings*. Boston: Houghton Mifflin Company.

Coopersmith, S. (1959). A method for determining types of self-esteem. *Journal of Abnormal and Social Psychology*, 59, 87-94.

Coopersmith, S. (1967). *The Antecedents of Self-esteem*. San Francisco, W.H. Freeman.

Cratty, B.J. (1968). A three-level theory of perceptual-motor behaviour. *Quest* IV, 3-10.

Cratty, B.J. (1970). *Perceptual and motor development in infants and young children*. New York: Macmillan.

Cratty, B.J. (1979). *Perceptual and motor development in infants and children*. Englewood Cliffs, N.J.: Prentice Hall.

Dawes, A. & Donald, D. (1994). *Childhood and adversity psychological perspectives from South African research*. Cape Town: David Philip Publishers.

Daws, J. (1995). Laban Movement Analysis: A key to individualizing children's dance. *Journal of Physical Education, Recreation and Dance*, Feb, 31-33.

Delacato, C.H. (1959). *The treatment and prevention of reading problems: The neurophysiological approach*. Springfield, Illinois: Charles C. Thomas.

Delacato, C.H. (1963). *The diagnosis and treatment of speech and reading problems*. Springfield, Illinois: Charles C. Thomas.

Denckla, M.B. (1984). Developmental dyspraxia. The clumsy child. In M.D. Levine & P. Satz (Eds.), *Middle Childhood: Development and Dysfunction* (pp. 245-260). Boston: University Park Press.

Dickstein, E. (1977). Self and self-esteem: Theoretical foundations and their implications for research. *Human Development*, 20, 129-140.

Dilorenzo, L. (1968). Effects of year-long Pre-kindergarten programs on intelligence and language of educationally disadvantaged children.

Doyle, B.A. & Higginson, D.C. (1984). Relationships among self-concept and school achievement, maternal self-esteem and sensory integration abilities for learning disabled children, ages 7 to 12 years. *Perceptual and Motor Skills*, 58, 177-178.

Drowatzky, J.N. (1981). *Motor learning principles and practices*. Burgess: Minneapolis (2nd edn.)

Duda, J.L. (1987). Toward a developmental theory of children's motivation in sport. *Journal of Sport Psychology*, 9, 130-145.

Dusek, J.B. & Flaherty, J.F. (1981). The development of self-concept during the adolescent years. *Monographs of the Society for Research in Child Development*, 46, (4), 191.

Dwyer, C. & McKenzie, B.E. (1994). Impairment of visual memory in children who are clumsy. *Adapted Physical Activity Quarterly*, 11, 179-189.

Eccles, J., Wigfield, A., Flanagan, C.A., Miller, C., Reuman, D.A. & Yee, D. (1989). Self-concepts, domain values and self-esteem: Relations and changes at early adolescence. *Journal of Personality*, 57 (2), 283-310.

Eccles, J., Wigfield, A., Harold, R.D. & Blumenfeld, P. (1993). Age and gender differences in children's self and task perceptions during elementary school. *Child development*, 64, 830-847.

Eliason, C & Jenkins, L. (1994). *A practical guide to early childhood curriculum* (5th edition) New York: Macmillan Publishing Company.

Elkind, D. (1971). *A sympathetic understanding of the child six to sixteen*. Boston: Allyn & Bacon.

Elkind, D. (1989). *Miseducation: Preschoolers at Risk*. New York: Knopf.

Faas, L.A. (1981). *Learning disabilities*. Boston: Houghton Mifflin.

Feldenkrais, M. (1984). *The master movers*. Cupertino, C.A.: Meta Publications.

Fleming, J.S. & Courtney, B.E. (1984). The dimensionality of self-esteem. Hierarchical facet model for revised measurement scales. *Journal of Personality and Social Psychology*, 46, 404-421.

Flinchum, B.M. (1988). Early childhood movement programs: Preparing teachers for tomorrow. *Journal of Physical Education, Recreation and Dance*, September, 62-69.

Fox, K.R. (1988). The child's perspective in physical education: The self-esteem complex. *British Journal of Physical Education*, 19, 247-252.

Frostig, M. & Horne, D. (1964). *The Frostig programme for development of visual perception*. Teacher's Manual. Chicago: Follett.

Frostig, M., Maslow, P., Lefever, W. & Wittlewey, J.R.R. (1964). *The Marianne Frostig Developmental Test of Visual Perception*. Palo Alto, California: Consulting Psychologists Press.

Frostig, M. & Maslow, P. (1970). *Movement education: theory and practice*. Chicago: Follett Educational Corporation.

Gabbard, C. (1988). Early childhood physical education: the essential elements. *Journal of Physical Education, Recreation and Dance*, September, 59(7), 65-69.

Gabbard, C., Le Blanc, B. & Lowy, S. (1987). *Physical Education for children: Building the foundation*. Englewood Cliffs, NJ: Prentice-Hall.

Gallahue, D.L. (1982). *Understanding Motor Development in Children*. New York: Wiley.

Gallahue, D.L. (1987). *Developmental physical education for today's elementary school children*. New York: Macmillan.

Gallahue, D.L. (1989). *Understanding Motor Development: Infants, Children, Adolescents* (2nd edn.). Indianapolis, Indiana: Benchmark Press Inc.

Gallahue, D.L. (1993). *Developmental physical education for todays' children.* Dubuque IA: Brown & Benchmark.

Gallahue, D.L. & Ozmun, J.C. (1995). *Understanding motor development.* USA: WCB Brown & Benchmark.

Gallahue, D.L., Werner, P.H. & Leudke, G.C. (1995). *A conceptual approach to moving and learning.* New York: Wiley.

Garber, H.L. & Slater, M. (1983). Assessment of the culturally different preschooler. In K.D. Paget & B.A. Bracken (Eds.), *The Psycho educational assessment of preschool children*, Chapter 18. New York: Grune & Stratton.

Garbers, J.G. (1980). *Vroeë skoolverlating in die grootstad.* Pretoria: Butterworth.

Gesell, A. (1973). *The first five years of life: A guide to the study of the preschool child.* New York: Harper & Row.

Getman, G.F.N. (1962). *How to develop a child's intelligence.* Minnesota: Research Publications.

Getman, G.N. & Kane, E.R. (1964). *The physiology of readiness: an actior program for the development of perception for children.* Minneapolis: Programs to accelerate school success.

Getman, G.N., Kane, E.R., Halgren, M.R. & Mc Kee, G.W. (1968). *Developing Learning Readiness. A visual-motor-tactile skills program teacher's manual.* St Louis: McGraw-Hill.

Geuze, R.H. & Börger, H. (1993). Children who are clumsy: Five years later. *Adapted Physical Activity Quarterly*, 10, 10-21.

Geuze, R.H. & Kalverboer, A.F. (1987). Inconsistency and adaption in timing of clumsy children. *Jounal of Human Movement Studies*, 13, 421-432.

Gilliam, T., MacConnie, S., Geenen, D., Pels, A. & Freedson, P. (1982). Exercise programs for children: A way to prevent. *The Physician and Sports Medicine*, 10 (9), 96-108.

Goldman, R.K. & Warren, D. (1976). Preliminary analysis of human-figure drawings as a kindergarden screening measure. *Perceptual and Motor Skills*, 43, 58.

Goodenough, F.L. (1926). *Children's drawings as measure of intellectual maturity.* New York: Harcourt, Brace Jovanovich.

Gordon, N. & McKinlay, I. (1980). *Helping Clumsy Children.* London: Churchill Livingstone.

Grineski, S. (1988). What is a truly developmentally appropriate Physical Education program for children? *Journal of Physical Education, Recreation and Dance*, August, 33-60.

Grové, M.C. (1978). 'n Opvoedkundige evaluering van die onderbou en implementering van 'n ongepubliseerde skoolgereedmakingsprogram vir skoolbeginners. Randse Afrikaanse Universiteit. M.Ed. Verhandeling.

Grové, M.C. (1986). *Volgende jaar skool toe*. Pretoria/Kaapstad: HAUM.

Gubbay, S.S. (1975). Clumsy children in normal schools. *The Medical Journal of Australia*, 1, 233-236.

Hankin, T. (1992). Presenting Creative Dance Activities to children: Guidelines for the non-dancer. *Journal of Physical Education, Recreation and Dance*, February, 22-24.

Hargreaves, A. (1994). *Changing teachers, changing schools*. London: Cassell.

Harris, D.B. (1963). *Children's drawings as measures of intellectual maturity*. New York: Harcourt, Brace & World.

Harter, S. (1978). Effectance motivation reconsidered: Toward a developmental model. *Human Development*, 1, 34-64.

Harter, S. (1981). A new self-report scale of intrinsic versus extrinsic orientation in the classroom: Motivational and informational components. *Developmental Psychology*, 17, 300-312.

Harter, S. (1982a). The Perceived Competence Scale for Children. *Child Development*, 53, 87-97.

Harter, S. (1982b). Development perspectives on self-esteem. In E.M. Hetherington (Ed), *Handbook of child psychology: Socialization, personality and social developments* (Vol. IV). New York: John Wiley.

Harter, S. (1983). Developmental perspectives on the self-esteem. In P.H. Mussen (Ed.), *Handbook of Child Psychology*, Vol. 4, 275-386. New York, Wiley (4th edn.).

Harter, S. (1985). Comperence as a dimension of self-education: Toward a comprehensive model of self-worth. In R. Leahy (Ed.), The Development of Self, 55-121. New York, Academic.

Harter, S. (1986). Processes underlying the construction, maintenance and enhancement of the self-concept in children. In J. Suls & A.C. Greenwald (Eds.), *Psychological perspectives on the self*, Vol 3, 137-181. Hillsdale, New Jersey, Lawrence Erlbaum Associates, Inc.

Harter, S. (1987). The determinants and mediational role of global self-worth in children. In N. Eisenberg (Ed.), *Contemporary issues in Developmental Psychology*. New York, Wiley.

Harter, S. (1988). Developmental processes in the construction of the self. In T.D. Yawkey & J.E. Johnson (Eds.), Integrative processes and socialisation: early to middle childhood. Hillsdale, New Jersey, Lawrence Erlbaum Associates, Inc.

Harter, S.& Pike, R. (1983). *The pictorial scale of perceived competence and social acceptance for young children*. Denver, Co: University of Denver.

Harter, S.& Pike, R. (1984). The pictorial scale of perceived competence and social acceptanc for young children. *Child Development*, 55, 1969-1982.

Hartlage, L.W. & Lucas, T.L. (1976). Differential correlates of Bender-Gestalt and Beery visual-motor integration test for black and white children. *Perceptual and Motor Skills*, 43, 1039-1042.

Hartlage, L.C. & Telzrow, C.F. (1983). Neuropsychological assessment. In K.D. Paget & B.A. Bracken (Eds.), *The Psycho educational assessment of preschool children*, chapter 13. New York: Grune & Stratton.

Hastie, P. (1988). Taking realistic steps towards reducing problems in dance teaching in physical educational. *The ACHPER National Journal*, March, 26-27.

Havighurst, R. J. (1964). Who are the socially disadvantaged? *Journal of Negro Education*, XXXIII, Summer, 216.

Heathington, B. S. (1980). Needed: Positive reading self-concepts. In T.D Yawkey (Ed.), *The Self-concept of the Young Child*, 63-71. USA: Brigham Young University Press.

Hebron, M.E. (1966). *Motivated Learning*. New York: Long Methuen & Ltd.

Henderson, S.E. (1986). Problems of motor development: some practical issues. *Advances in Special Education*, vol. 5, 187-218.

Henderson, S.E. (1992). Clumsiness or developmental co-ordination disorder: A neglected handicap. *Current Paediatrics*, 2, 158-162.

Henderson, S.E. & Hall, D. (1982). Concomitants of clumsiness in young children. *Developmental Medicine and Child Neurology*, 24, 448-460.

Henderson, S.E., May, D.S. & Umney, M. (1989). An exploratory study of goal-setting behaviour, self-concept and loss of control in children with movement difficulties. *European Journal of Special Needs Education*, 4(1), 1-14.

Henderson, S. E. & Sugden, D. (1992). *Movement Assessment Battery for Children*. London: The Psychological Corporation.

Herbert, L.M. & Katzenellenbugert, E.H. (1995). Kreatiwiteit en bewegingsgedrag by 'n multi-kulturele groep pre-primêre leerlinge. *S.A. Journal for Research in Sport, Physical Education and Recreation*, 18(2), 15-27.

Herkowitz, J. (1977). Movement experiences for preschool children. *Journal of Physical Education and Recreation*, March 48(3), 15-16.

Hoare, D. (1994). Subtypes of developmental co-ordination disorder. *Adapted Physical Activity Quarterly*, 11, 158-169.

Horn, T.S. & Hasbrook, C.A. (1987). Psychological characteristics and the criteria children use for self-evaluation. *Journal of Sport Psychology*, 9, 208-221.

Hulme, C., Biggerstaff, A, Moran, G. & McKinlay, I. (1982a). Visual, kinaesthetic and cross-model judgements of length by normal and clumsy children. *Developmental Medicine and Child Neurology*, 24, 461-471.

Hulme, C., Smart, A. & Moran, G. (1982b). Visual, kinaesthetic and cross-model judgements of length by normal and clumsy children. *Neuropsychologia*, 20(4), 475-481.

Human Science Research Council (1966). Schools and Colleges register of needs survey. The Education Foundation, Eastern Cape School building programme and 10th school day survey 1997; source 11 July 1997, Department of Education and Training.

Hunt, J.McV. (1961). *Intelligence and experience*. New York: Ronald Press.

Ignico, A.A. (1991a). Effects of a competency based instructional program on first-grade children's gross motor development. *Indiana Journal for Health, Physical Education, Recreation and Dance*, 20, 33-35.

Ignico, A.A. (1991b). Physical education for head start children: A field-based study. *Early Child Development and Care*, 77, 83-95.

Ignico, A. (1994). Early childhood Physical Education: Providing the foundation. *Journal of Physical Education, Recreation and Dance*, August, 28-30.

Ilg, F.L. & Ames, L.B. (1972). *School readiness: Behaviour tests used at the Gesell institute*. New York: Harper & Row.

Jachens, L.J. (1997). Cognitive processing: A descriptive study of grade 1 children in the Eastern Cape. Unpublished M.A. thesis: University of Port Elizabeth.

Jackson, E.G. (1958). The impact of environment on racial achievement. *Journal of Human Relationships*, 6, 47-63.

Jacobs, L.J. & Vrey, J.D. (1982). *Self-konsep, diagnose en terapie: 'n Opvoedkundig-sielkundige benadering*. Pretoria: Academica.

Jersiid, A.T. (1952). *In search of self*. New York, Teachers College, Columbia University.

Johnston, O., Short, H. & Crawford, J. (1987). Poorly co-ordinated children: A survey of 95 cases. *Child: Care, Health and Development*, 13, 361-376.

Jones, R.A. (1985). *Research Methods in the Social and Behavioral Sciences*. Sunderland, MA: Sinauer Associates.

Joyce, M. (1993). *First steps in Teaching Creative Dance to Children*. Mountain View, CA: Mayfield.

Kachelhoffer, E.S. (1988). 'n Motoriese begeleidingsprogram vir kinders in die pre-primêre skoolfase. 'n Ongepubliseerde M.Ed-verhandeiing in Opvoedkunde: Johannesburg Randse Afrikaanse Universiteit

Kalliopuska, M. & Karila, I. (1987). Association of motor performance and cognitive, linguistic and socioemotional factors. *Perceptual and Motor Skills*, 65, 399-405.

Kalverboer, A.F. (1988). Hyperactivity and observational studies. In L.N. Bloomingdale & J.A. Sergeant (Eds.), *Attention deficit disorder: Criteria, cognition and intervention*, vol. 5, 29-42. Oxford: Pergamon.

Kalverboer, A.F., De Vries, H. & van Dellen, T. (1990). Social behaviour in clumsy children as rated by parents and teachers. In A.F. Kalverboer (Ed.), *Developmental biopsychology: Experimental and observational studies in children at risk*, 257-269. Ann Arbor: The University of Michigan Press.

Kavale, K. & Mattson, P.D. (1983). One jumped off the balance beam: Meta-analysis of Peceptual-motor training. *Journal of learning Disabilities*, 16: 165-173.

Keogh, J.F. (1959). Relationship of motor ability and athletic performance in certain standardised personality measures. *Research Quarterly*, 30, 438-445.

Keogh, J.F. & Sugden, D. (1985). *Movement skill development*. New York: Macmillan.

Keogh, J.F., Sugden, D.A., Reynard, C.L., & Calkins, J.A. (1979). Identification of Clumsy Children: Comparisons and Comments. *Journal of Human Movement Studies, 5, 32-41.*

Kephart, N.C. (1960). *The slow learner in the classroom*. Columbus: Charles E Merrill.

Kephart, N.C. (1964). Perceptual-motor aspects of learning disabilities. *Exceptional Children*, 31, 201-206.

Kephart, N.C. (1971). *The slow learner in the classroom* (2nd Edn.). Columbus: Charles E Merrill.

Kershner, K.M. & Dusewicz, R.A. (1970). *Oseretsky tests of motor development*. Perceptual and Motor Skills, 30, 302.

Kifer, E. (1975). Relationships between academic achievement and personality characteristics: A quasi-longitudinal study. *American Educational Research Journal*, 12, 191-210.

Klaus, R.A. & Gray, S.W. (1968). *Monographs of the society for research in child development*, 33(120) 4. The early training project for disadvantaged children: A report after 5 years. The University of Chicago Press.

Knoblock, H. & Pasamanick, B. (1974). *Gesell and Amatruda's Developmental Diagnosis* (3rd ed.). New York: Harper & Row.

Kok, J.C. (1970). 'n Pedagogiese beoordeling van waarde-orientasie by milieu-gestremde kinders. D.Ed-proefskrif, Port Elizabeth: Universiteit van Port Elizabeth.

Kok, J.C. (1975). *Leerprobleme en perseptueel-motoriese ordening*. Johannesburg: Perskor.

Kokenes, B. (1974). Grade level differences in factors of self-esteem. *Developmental Psychology*, 10, 954-958.

Koppitz, E.M. (1962). Diagnosing brain damage in young children with the Bender-Gestalt test. *Journal of Clinical Psychology*, 26, 541-546.

Koppitz, E.M. (1964). *The Bender-Gestalt test for young children*. New York: Grune & Stratton.

Laszlo, J.I. & Bairstow, P.J. (1985). *Perceptual motor behaviour*. New York: Plenum Press.

Laszlo, J.I., Bairstow, P.J., Bartrip, J. & Rolfe, V.T. (1988). Clumsiness or perceptual-motor dysfunction? In A. Colley & J. Beech (Eds.), *Cognition and action in skilled behaviour*, (pp. 293-316). Amsterdam: North-Holland.

Laszlo, J.I. & Broderick, P. (1985). The perceptual-motor skill of drawing. In N.H. Freeman & M.V. Cox (Eds.), *Visual order: The nature and development of pictorial representation*, (pp. 356-373). Cambridge, U.K.: Cambridge University Press.

Lazar, I. & Darlington, R. (1982). Lasting effects of early education: A report from the Consortium for longitudinal studies. *Monographs of the Society for research in Child Development*, (195), 2-3. Illinois: University of Chicago Press.

Lerch, H.A., Becker, J.E., Ward, B.M. & Nelson, J.A. (1980). *Perceptual-motor learning - Theory and Practice*. Palo Alto: Peek Publications.

Lerner, J., Mardell-Czudnowski, C. & Goldenberg, D. (1987). *Special Education for the Early Childhood Years*. Jersey: Prentice-Hall.

Levine, D.U. (1962). City schools today: too late with too little? *Phi delta Kappan*, 44, 80-83.

Lord, R. & Hulme, C. (1987). Perceptual judgements of normal and clumsy children. *Developmental Medicine and Child Neurology*, 29 250-257.

Lord, R. & Hulme, C. (1988). Pattern of rotary pursuit performance in clumsy and normal children. *Journal of Child Psychology and Psychiatry*, 29, 691-701.

Lord, R. & Hulme, C. (1988). Visual perception and drawing ability in clumsy and normal children. *British Journal of Developmental Psychology*, 6, 1-9.

Losse, A. Henderson, S.E., Elliman, D., Hall, D., Knight, E. & Jongmans, M. (1991). Clumsiness in children - Do they grow out of it? A ten year follow-up study. *Developmental Medicine and Child Neurology*, 33, 55-68.

Lowder, R.B. (1956). *Perceptual Abilities and School Achievement: An Exploratory Study*. Winter Haven: Winter Haven Lion's Club.

Liddel, C. & Kvaisvig, J. (1990). Science and social accountability: issues related to South African developmental psychology. *South African Journal of Psychology*, 20, 1-9.

Louw, D.A. (1990). *Menslike ontwikkeling*. Pretoria: HAUM.

Luquet, G.H. (1927). *Le Dessin Enfantin*. Paris: Alcan.

Lyytinen, H. & Ahonen, T. (1989). Motor precursors of learning disabilities. In D.J. Bakker & D. J. Van der Vlugt (Eds), *Learning disabilities*, vol 1. Neuropsychological correlates (pp. 35-43). Amsterdam: Swets & Zeitlinger.

MacIntosh, D. (1974). The nature and structure of general motor abilities. *American Corrective Therapy Journal*, 28,(6), 183-187.

Mc Cloy, C.H. (1968). A preliminary study of factors in motor educability. In R.C. Brown and G.S. Kenyon (eds), *Classical Studies on physical activity*. Englewood Cliffs, NJ: Prentice-Hall: (pp. 307-318).

Mc Graw, M. (1963). *The neuromuscular maturation of the human infant*. New York: Hafner.

Maeland, A.F. (1992). Identification of children with motor co-ordination problems. *Adapted Physical Activity Quarterly*, 9, 330-342.

Mangold, S. (1980). Nurturing high self-esteem in visually handicapped children. In T.D. Yawkey (Ed.), *The Self-concept of the Young Child*, 177-186. USA: Brigham Young University Press.

Marsh, H.W. (1985). The structure of masculinity / femininity: An application of confirmatory factor analysis to higher order factor structures and factorial invariance. *Multivariate Behavioural Research*, 20, 427-449.

Marsh, H.W. (1986). Global self-esteem: Its relation to specific aspects of self-concept and their importance. *Journal of Personality and Social Psychology*, 51, 1224-1236.

Marsh, H.W. (1987). The hierarchical structure of self-concept and the application of hierarchical confirmatory factor analysis. *Journal of Educational Measurement*, 24(1), 17-39.

Marsh, H.W. (1989). Age and sex effects in multiple dimensions of self-concept. *Journal of Educational Psychology*, 81(3), 417-430.

Marsh, H.W. (1990). Causal ordering of academic self-concept and academic achievement: A multivariate, longitudinal panel analysis. *Journal of Educational Psychology*, 82, 646-656.

Marsh, H.W., Barnes, J., Cairns, L. & Tidman, M. (1984). Self-description questionnaire: Age and sex effects in the structure and level of self-concept for preadolescent children. *Journal of Educational Psychology*, 76(5), 940-956.

Marsh, H.W., Barnes, J. & Hocevar, D. (1985). Self-other agreement on multidimensional self-concept ratings: Factor analysis and multitrait-multimethod analysis. *Journal of Personality and Social Psychology*, 49, 1360-1377.

Marsh, H.W., Craven, R.G. & Debus, R. (1991). Self-concepts of young children 5 to 8 years of age: Measurement and multidimensional structure. *Journal of Educational Psychology*, 83(3), 377-392.

Marsh, H.W. & O'Niel, R. (1984). Self description questionnaire III (SDQIII): The construct validity of multidimensional self-concept ratings by late adolescents. *Journal of Educational Measurement*, 21, 153-174.

Marsh, H.W., Relich, J.D. & Smith, I.D. (1983). Self-concept: The construct validity of interpretations based upon the SDQ. *Journal of Personality and Social Psychology*, 45, 173-187.

Marsh, H.W. & Shavelson, R. (1985). Self-concept: Its multifaceted hierarchical structure. *Educational Psychologist*, 20, 107-123.

Martin, H.P., Gilfoyle, E.M., Fischer, H.L., & Greuter, B.B. (1969). Assessment of perceptual development. *American Journal of Occupational Therapy*, 23, 387-396.

Martinek, T.J., Zaichkowsky, L.D. & Cheffers, J.F.F. (1977). Decision making in elementary age children: Effects on motor skills and self-concept. *Research* Quarterly, 48, 349-357.

Marx, R.W., & Winne, P.H. (1975). Self-concept and Achievement: Implication for Educational Programs. *Integrated Education*, 13(1), 30-31.

Mayer, K.F., Marias, H.C. & Prinsloo, R.J. (1991). Psychology: The high road or the low road? *South African Journal of Phycology*, 21(2), 90-96.

Meisels, S.J. (1986). Testing 4- and 5-year olds. *Educational Leadership*, 44, 90-92.

Miller, S. (1978). The facilitation of fundamental motor skill learning in young children. Unpublished doctoral dissertation, Michigan State University, East Lansing.

Missiuna, C. (1994). Motor skill acquisition in children with developmental coordination disorder. *Adapted Physical Activity Quarterly*, 11, 214-235.

Miyahara, M. (1994). Subtypes of students with learning disabilities based upon gross motor functions. *Adapted Physical Activity Quarterly*, 11, 368-382.

Mon-Williams, M.A., Wann, J.P. & Pascal, E. (1994). Ophthalmic factors in developmental co-ordination disorder. *Adapted Physical Activity Quarterly*, 11, 170-178.

Moran, J.M. & Kalakian, L.H. (1979). Movement experiences for the mentally retarded or emotionally disturbed child (2nd edn.). Minneapolis, Minnesota: Burgess.

Myers, P.I. & Hammill, D.D. (1969). Methods for learning disorders. New York: Wiley.

National Association for the Education of Young Children (1988). NAEYC position statement on developmentally appropriate practice in the primary grades, serving 5-through 8-year-olds. *Young Children*, 43, 64-84.

National Education Co-ordinating Committee - NEPI (1992). Early childhood educare: Report of the NEPI education research group. A project of the National Education Co-ordinating Committee. Cape Town: Oxford University Press / NELL.

The National Society for the Study of Education. The educationally retarded and disadvantaged. The sixty-sixth yearbook part I. Witty, P.A. (Ed). Chicago: The University of Chicago Press.

Nichols, B. (1990). *Moving and Learning: The Elementary School Physical Education Experience* (3rd edn.). St Louis: Mosby.

O'Dwyer, S. (1987). Characteristics of highly and poorly co-ordinated children. *The Irish Journal of Psychology*, 8(1), 1-8.

Omwake, E.B. (1971). The young child...we know so much - we know so little. In The Significance of the Young Child's Motor development (pp. 10-15). Proceedings of a conference sponsored by The American Association for Health, Physical Education and Recreation and The National Association for the Education of Young Children (NAEYC). Washington D.C.

Overby, L.Y. (1992). A comparison of novice and experienced dancers' body awareness. In L.Y. Overby & J.H. Humphrey (Eds.), *Dance - current selected research*, vol3, (pp. 57-72). New York: AMS Press.

Page, R.M., & Page, T.S. (1992). *Fostering Emotional Well-being in the Classroom*. Boston: Jones & Bartlett.

Paget, K.D. & Bracken, B.A. (1983). *The Psycho educational assessment of preschool children*. New York: Grune & Stratton.

Paine, R.S. & Oppe, T.E. (1966). *Neurological examination of children*. Philadelphia: Lippincott.

Painter, G. (1966). The effect of a rhythmic and sensory motor activity program on perceptual motor spatial abilities of kindergarten children. *Exceptional Children*, October, 113-116.

Pangrazi, R. (1982). Physical education, self-concept and achievement. *Journal of Physical Education, Recreation and Dance*, November, 16-18.

Payne, G. (1990). Observing and facilitating skill sequencing. In W.J. Stinson (Ed.), *Moving and Learning for the Young Child*, (pp. 107-115).

Pelligrini, A.D. (1991). *Applied child study* (2nd edn.). London: Academic Press

Phillips, D.A. & Zigler, E. (1980). Self-concept theory and its practical implications. In T.D. Yawkey (Ed.), *The Self-concept of the Young Child*, 111-122. USA: Brigham University Press.

Piaget, J. (1952). *The origins of intelligence in children*. New York: International University Press.

Piaget, J. (1963). *The origins of intelligence in children* (2nd edn.). New York: W.W. Norton.

Piaget, J. & Inhelder, B. (1956). *The Child's Conception of Space* (translated by F.J. Langdon & J.L.Lunzer), London: Routledge & Kegan Paul.

Pica, R. (1992). In S.W. Sanders (Ed.), *Designing Preschool Movement Programs*. Champaign: Human Kinetics.

Pienaar, A.E. (1992). Linkshandigheid, lateraliteit en grootmotoriese koördinasie by ses tot negejarige kinders. *S.A. Journal for Research in Sport, Physical Education and Recreation*, 15(2), 33-39.

Piers, E.V. & Harris, D. B. (1964). Age and other correlates of self-concept in children. *Journal of Educational Psychology*, 55, 91-95.

Piers, E.V. & Harris, D. B. (1969). *The Piers-Harris children's self-concept scale*. Nashville, Tennissee, counsellor recordings and tests.

Platzer, W.S. (1976). Effects of perceptual-motor training on gross motor skill and self-concept of young children. *The American Journal of Occupational Therapy*, 30, 423-428.

Prechtl, H.F.R. (1977). Assessment and significance of behavioural states. In S.R. Berenberg (Ed.), *Brain-fetal and infant - current research on normal and abnormal development* (pp. 79-90). The Hague: Nijoff.

Prechtl, H.F.R. & Beintema, D.J. (1964). *The neurological examination of the full term newborn infant*. London: Heinemann.

Pretorius, J.W.M. (1995). *Opvoeding, Samelewing, Jeug*. Pretoria: J.L. van Schaik.

Purkey, W.W. (1970). *Self-concept and School achievement*. Englewood Cliffs, New Jersey: Prentice Hall.

Ras, B. (1981). Die sinsamehang tussen liggaamlikheid en die psigiese lewensvoltrekking van die kind-in-opvoeding.

Rasmussen, P., Gilberg, C., Waldenström, E. Svenson, B. (1983). Perceptual, motor and attentional deficits in seven-year-old children: neurological and neurodevelopmental aspects. *Developmental Medicine and Child Neurology*, 25, 315-333.

Reynolds, A.J. (1994). Effects of a pre-school plus follow-on intervention for children at risk. *Developmental Psychology*, 30(6), 787-804.

Riordan, Z.V.A. (1975). The effects of sensorimotor training on the body image of children with minimal brain dysfunction. Unpublished MA manuscript: University of Port Elizabeth.

Roach, E.G. & Kephart, N.C. (1966). *The Purdue Perceptual-Motor Survey*. Columbus: Merrill.

Roderick, J.A. (1980). The Social Self: Children and significant others. In T.D.Yawkey (Ed.), *The self-concept of the young child* (pp. 63-71). USA: Brigham Young University Press.

Rogers, C. & Dymond, R. (1954). *Psychotherapy and personality change*. Chicago, University of Chicago Press.

Rösblad, B. & von Hofsten, C. (1994). Repetitive goal-directed arm movements in children with developmental co-ordination disorders: Role of visual information. *Adapted Physical Activity Quarterly*, 11, 190-202.

Rosenburg, M. (1965). *Society and Adolescent Self-image*. New Jersey: Princeton University Press.

Rosenburg, M. (1979). *Conceiving the Self*. New York: Basic Books.

Salkever, M. & Singerman, J. (1990). When should early education begin? In C. Seefeldt (Ed.), *Continuing issues in early childhood education* (pp. 57-105). Columbus: Merril.

Salkind, N.J. & Ambron, S.R. (1987). *Child Development* (5th edn.). New York: Holt, Rinehart & Winston.

Sapir, S.G. (1966) Sex differences in perceptual motor development. *Perceptual and Motor Skills*, 22, 979-986.

Schaney, Z., Brekke, B., Landry, R. & Burke, J. (1976). Effects of a perceptual-motor training program on kindergarten children. *Perceptual and Motor Skills*, 43, 428-430.

Schempp, P.G., Cheffers, J.T.F. & Zaichkowsky, L.D. (1983). Influence of decision making on attitudes, creativity, motor skills and self-concept in elementary children. *Quarterly for Exercise and Sport*, 540(2), 183-189.

Schickedanz, J.A., York, M.E., Stewart, I.S. & White, D.A. (1990). Strategies for teaching young children (3rd edn.). Boston: Allyn & Bacon.

Schlodder, M.I. (1986). The Beery visual-motor integration test: A cross-ethnic comparison of normal pre-school children. Unpublished manuscript, M.A. University of Port Elizabeth.

Schoeman, R.A. (1993). Psycho-linguistic assessment model in a multicultural pre-school setting. Unpublished doctoral dissertation, University of the Orange Free State.

Schmidt, R.E. & Nagata, L.M. (1983). *Contemporary issues in special Education* (2nd edn.). USA: McGraw-Hill.

Schoemaker, M.M., Hijlkema, M.G.J. & Kalverboer, A.F. (1994). Physiotherapy for clumsy children - An evaluation study. *Developmental Medicine and Child Neurology*, 36, 143-155.

Schoemaker, M.M. & Kalverboer, A.F. (1994). Social and affective problems of children who are clumsy: How early do they begin? *Adapted Physical Activity Quarterly*, 11, 130-140.

Schweinhart, L.J., Weikart, D.P. & Larner, M.B. (1986). Consequences of three preschool curriculum models through age 15. *Early Childhood Research Quarterly*, 1, 15-45.

Schweinhart, L.J. & Weikart, D.P. (1980). *Young children grow up: The side effects of the Perry preschool program on youths through age 15*. YPSILANTI, MI: High / scope Educational Research Foundation.

Schweinhart, L.J. & Weikart, D.P. (1986). Early childhood development programs. A public investment opportunity. *Educational Leadership*, 4-12.

Seefeldt, C. (1987). The visual arts. In C. Seefeldt (Ed.), *The early childhood curriculum: A review of current research* (pp. 183-210). New York: Teacher College Press.

Seefeldt, V. (1979). Development motor patterns: Implications for elementary school physical education. In C. Nadeau, W. Holliwell, K.Newell & G. Roberts (Eds). *Psychology of Motor Behaviour and Sport*,(p. 317). Champaign, Il: Human Kinetics.

Seefeldt, V. & Haubenstricker, J. (1982). Patterns, phases or stayes: Analytical model for the study of developmental movement. In J.A.S. Kelso & J.E. Clark (Eds.), *The deveopment of movement control and co-ordination*, (pp. 309-318). New York: John Wiley.

Shavelson, R.J. & Bolus, R. (1982). Self-concept: The interplay of theory and methods. *Journal of Educational Psychology*, 74, 3-17.

Shavelson, R.J., Hubner, J.J. & Stanton, G.C. (1976). Validation of construct interpretations. *Review of Educational Research*, 46, 407-441.

Shaw, L., Levine, M.D. & Belfer, M. (1982). Developmental double jeopardy: A study of clumsiness and self-esteem in children with learning problems. *Developmental and Behavioural Pediatrics*, 3(4), 191-196.

Sloan, W. (1955). The Lincoln-Oseretsky motor development scale. *Genetic Psychology Monographs*, 51, 183-252.

Smyth, T.R. & Glencross, D.J. (1986). Information processing deficits in clumsy children. *Australian Journal of Psychology*. 38,(1), 13-22.

Soares, L.M. & Soares, A.T. (1982, July). Convergence and discrimination in academic self-concepts. Paper presented at the 20th Congress of the International Association of Applied Psychology, Edinburgh, Scotland.

South African Institute of Race Relations (1992). Race relations survey. Braamfontein: SAIRR.

Stager, S. & Young, R.D. (1982). A self-concept measure for preschool and early primary grade children. *Journal of Personality Assessment*, 46, 536-543.

Stinson, S.W. (1985). Praget for dance educators: A theoretical study. *Dance Research Journal*. Spring/summer, 17(1), 9-16.

Stinson, S.W. (1988). Creative dance for preschool children. *Journal of Physical Education, Recreation and Dance*, September, 52-56.

Stinson, S.W. (1990). Dance and the developing child. In W.J. Stinson (Ed.). *Moving and Learning for the Young Child*, (pp. 139-150). Washington D.C.: American Alliance for Health, Physical Education, Recreation and Dance.

Stipek, D.J. (1984). Young children's performance expectations: Logical analysis of wishful thinking? In J.S. Nicholls (Ed.), *The Development of Achievement Motivation*, 33-56. Greenwich, CT, JAI.

Stipek, D.J. & MacIver, D. (1989). Developmental change in children's assessment of intellectual competence. *Child Development*, 60, 521-538.

Stott, D.H., Henderson, S.E. & Moyes, F.A. (1986). The Henderson revision of the test of motor impairment - A comprehensive approach to assessment. *Adapted Physical Activity Quarterly*, 3, 209-216.

Sugden, D.A., & Keogh, J.F. (1990). *Problems in Movement Skill Development*. Columbia: University of South Carolina Press.

Super, S. (1979). An evaluation of the influence of a learning readiness program on the perceptual development of the grade 1 child. Unpublished MEd Thesis, RAU.

Survant, A. (1972). Building Positive Self-concepts. *Instructor*, 81, 94-95.

Talbot, M.L. & Junkala, J. (1981). The effects of auditorially augmented feedback on the eye-hand coordination of students with cerebral palsy. *American Journal of Occupational Therapy*, 35, 525-528.

Tennant, A.J. (1986). Visual-motor perception: A correlative study of specific measures for pre-school South African children. Unpublished M.A. Thesis, University of Port Elizabeth.

Telzrow, C.F., & Hartlage, L.C. (1981). Neuropsychological assessment of preschool children. Paper presented to the International Neurological Society, Atlanta, February.

Thomas, G.V. & Silk, A.M.J. (1990). *An introduction to the psychology of children's drawings*. Hertfordshire, Harvester Wheat Sheaf.

Thomas, J.R. & Chisson, B.S. (1972). Relationships as assessed by canonical correlation between perceptual-motor and intellectual abilities for pre-school and early elementary age children. *Journal of Motor Behaviour*, 4, 23-29.

Thomas, J.R., & Nelson, J.K. (1990). *Research Methods in Physical Activity* (2nd ed.). Illinois: Human Kinetics.

Tolor, A. & Schulbert, H. (1963). *An evaluation of the Bender-Gestalt test*. Springfield: Thomas.

Van Dellen, T. & Geuze, R.H. (1988). Motor response processing in clumsy children. *Journal of Child Psychology and Psychiatry*, 29, 489-500.

Van Rossum, J.H.A. & Vermeer, A. (1990). Perceived competence: A validation study in the field of motoric remedial teaching. *International Journal of Disability, Development and Education*. 37(1), 71-91.

Van Zijl, T. (1985). The effects of an activity programme on perceptual-motor abilities and self-concept of preschool children. Unpublished M.A. dissertation. University of Port Elizabeth.

Vereecken, P. (1961). *Spatial development*. Groningen, Netherlands: J.B. Wolters.

Vernon, P.E. (1950). *The Structure of Human Abilities.* London: Methuen.

Vrey, J.D. (1984). *Die Opvoeding in sy Self Aktualisering.* Pretoria, Universiteit van Suid Afrika: Guttenberg Boekdrukkers.

Wall, A.E., Reid, G. & Paton, J. (1990). The syndrome of physical awkwardness. In J. Summers (Ed.), *Problems in Movement Control,* 283-316. Amsterdam: Elsevier Science.

Wann, J.P. (1986). Handwriting disturbances: Developmental trends. In H.T.A. Whiting & M.S. Wade (Eds.), *Themes in Motor Development,* (pp. 207-223). Dordrecht, The Netherlands: Martinus Nijhoff.

Wann, J.P. (1987). Trends in the refinement and optimigation of fine-motor trajectories: Observations from an analysis of the handwriting of primary school children. *Journal of Motor Behaviour,* 19, 13-37.

Weeks, Z.R. & Ewer-Jones, B. (1983). Assessment of perceptual-motor and fine motor functioning. In K.D. Paget & B.A. Bracken (Eds.), *The Psychoeducational assessment of preschool children,* Chapter 12. New York: Grune & Stratton.

Weikart, D.P. (1989). Hard choices in early childhood care and education: A view of the future. *Young Children,* March, 25-30.

Weiller, K.H. (1992). The social-emotional component of physical education for children. *Journal of Physical Education, Recreation and Dance,* August, 50-55.

Weingarten, G. (1980). The contribution of athletic and physical variables to social status in Israeli school boys. *International Journal of Physical Education,* 17, 23-26.

Weiss,M.R. (1987). Self-esteem and Achievement in Children's Sport and Physical Activity. In D. Gould & M.R. Weiss (Eds), *Advances in Paediatric Sport Sciences* (pp 87-120). Champaigne, IL: Human Kinetics.

Werner, E.E. (1979). *Cross-cultural child development: A view from the planet Earth.* Monterey, California: Brooks / Cole.

Whitehurst, K.E. (1971). The young child ... What movement means to him. In G. Engstrom (Ed.), *The Significance of the Young Child's Motor Development,* pp. 51 – 55. Proceedings of a Conference sponsored by The American Association for Health, Physical Education and Recreation and the NAEYC. Washington, D.C.

Wicks-Nelson, R. & Israel, A.C. (1984). *Behaviour Disorders of Childhood.* New Jersey: Prentice-Hall, Inc., Englewood Cliffs.

Wiegersma, P.H. (1980). *Motorische diagnosiek.* Lisse: Swets & Zeitlinger.

Williams, H.S. (1983). *Perceptual and Motor Development.* New Jersey: Prentice-Hall.

Williams, H.G. & DeOrea, K. (1980). Perceptual-motor development in children. In C. Corbin (Ed.), *A Textbook of Motor Development.* Dubuque, Iouta: W.C. Brown.

Winne, P.H., & Marx, R.W. (1981, April). Convergent and discriminant validity in self-concept measurement. Paper presented at the annual meeting of the American Educational Research Associaiton, Los Angeles.

Winne, P.H., Marx, R.W., & Taylor, T.D. (1977). A multitrait-multimethod study of three self-concept inventories. *Child Development*, 48, 893-901.

Wright, H.C. (1997). Children with developmental co-ordination disorder - A review. *European Journal of Physical Education*, 2, 5-22.

Wright, H.C. & Sugden, D.A. (1996a). A two-step procedure for the identification of children with developmental co-ordination disorder in Singapore. *Developmental Medicine and Child Neurology*, 38, 1099-1105.

Wright, H.C. & Sugden, D.A. (1996b). The nature of developmental co-ordination disorder: inter and intragroup differences. *Adapted Physical Activity Quarterly*, 13, 357-371.

Wright, H.C., Sugden, D.A., Ng, R. & Tan, J. (1994). Identification of children with movement problems in Singapore: usefulness of the movement ABC checklist. *Adapted Physical Activity Quarterly*, 11. 150-157.

Wylie, R. (1974). *The self-concept: A review of methodological considerations and measuring instruments* (rev. edn., vol. 1). Lincoln, Nebraska, University of Nebraska Press.

Yawkey, T.D. (1980). *The self-concept of the young child.* USA: Brigham Young University Press.

Younger, L. (1989). Dance-The fascination and the frustration. *The British Journal of Physical education*, 20(4), 167 – 169.

Zaichkowsky, L.D., Zaichkowsky, L.B. & Martinek, T.J. (1980). *Growth and development: The child and physical activity.* St Louis, C.V. Mosby.

Zimiles, H. (1986). The social context of early childhood in an era of expanding preschool education. In B. Spodek (Ed.), *Today's kindergarden: exploring the knowledge base, expanding the curriculum.* New York: Teachers College Press.